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RESEARCH ARTICLE

The effect of Financial Development on Economic Growth: Evidence from South Asian Developing Countries

Robeena Bibi[1], Sumaira[2]*

[1]School of Public Administration, Hohai University, Nanjing China
[2]College of Economics and Management, Zhejiang Normal University, Zhejiang, China

Corresponding Author: Sumaira, Sumairakhan321321@gmail.com

Abstract

The debate on financial development and economic growth has been comprehensively growing for a long time in the theoretical and empirical literature but there are still conflicting views on this association. Several studies have been conducted on different regions and countries whether banks or stock market finance have any influence on economic growth but the results are still far from a significant conclusion. The empirical findings inclined the view that both banks and stock markets have positive impact on economic growth however some studies support the negative association which may varies on different sample of countries, methodology of the study, proxies for financial development and over time. Based on the ongoing debate, the current study examines the impact of both stock markets and bank based financial development on economic growth in four developing countries of south Asia for the period of 1980-2017. The study use static, dynamic and long run estimators to efficiently investigate this association. The outcomes specifies that both market based and bank based financial development indices affect economic growth significantly and positively which indicates that the development of banking system and stock markets perform a very propounding role in strengthening economic growth in the sample countries. The long run estimators also confirm the presence of long run association between variables. The robustness tests confirm the results of all models that both banks and stock markets development are important and contribute to economic growth in the same way in the sample countries and can't be differentiated. The findings of this study have important policy suggestions to the sample countries government's channels, regulatory and supervisory efforts on further improvement of both stock markets and bank-based development in order to attain higher economic growth.

Keywords: Bank based financial development; Market based financial development, Economic growth; Dynamic Models; South Asian countries

Introduction

The nexus between financial development and economic growth is much debated issue in the preceding literature. The importance of financial development is considered to be an important driver of economic growth of a country. The growing empirical and theoretical studies demonstrates that financial development of a country accelerate economic growth such as (Asteriou & Spanos, 2019); (Hoi, Lan Ho, & Duong Vu, 2019); and (Adusei, 2019). The theoretical association of financial development and economic growth can be traced back to the work of Schumpeter (1912) argue that a well-developed financial system accelerate economic growth. Well-structured financial system is considered as a key for industrialization Gerschenkron (1962). This statement is

also endorsed by McKinnon (1973) and Shaw (1973). They statues that liberal financial markets enhance economic growth while repressive financial markets hinder it. (T Beck & Levine, 2002) examines banks development and market-based financial structure and found that both indicators play the same role in finance growth nexus. Nevertheless (Stiglitz, 1985) claims that bank based financial structure endorse more to growth than stock markets, while (Boyd & Smith, 1998) and (A. J. Levine, 1997); have opposing arguments to this. Empirical findings of different researchers have obtained mixed results regarding financial development and economic growth such as the study of (King & Levine, 1993), (Odedokun, 1996) and also the study of (Schumpeter, 1911), (Shaw, 1973); (Fishkin, Keniston, & McKinnon,

1973) and (Goldsmith, 1969) evidenced the positive association of financial development and economic growth while (Van Wijnbergen, 1983) and (Buffie, 1984) supports negative association. Considering stock market indicators, some studies have found casual association while some studies have used both the stock market and banks development indicators and have found the same results (Marques et al., 2013), (R. Levine & Zervos, 1999) (Nurudeen, 2009).

Some studies shows that banks perform better than stock markets in explaining economic growth. (Hoshi, Kashyap, & Scharfstein, 1990) statutes that there may be sensitivity to stock market prices in the market-based system where involved short term investments (Hoshi et al., 1990). Variation in results could be heterogeneity in the level of financial development in income countries Rioja & Valev, 2014) or it could be due to the nonlinear relationship between financial development and growth. Demirguc-Kunt, Feyen, and Levine (2013) illustrates that the contribution of banks becomes smaller when countries developed while an increase in output and an increase in stock market becomes larger. This discussion regarding the linkage of finance and growth is still under debate and it's important to reexamine this issue to provide better suggestion to policy makers of the sample countries of this study through which they can build financial structure in their different stages of development. The current study contributes to the existing literature in several ways on the impact of financial development on economic growth. Hsu, Tian, and Xu (2014) argued that capital markets are superior in contribution to economic growth than banking sector development by greater productivity gain and faster technological innovation.

Some authors argue that when economy developed, the contribution of banks to economic growth declines and the capital markets increase. The market-based finance is considered advantageous than banking sector in promoting productivity enhancement and technological innovations but it might be applicable in developed countries. It's been also debated that financial development effect economic growth only in high income or developed countries. Based on the above statements, this study examines the impact of both market based and bank based financial development on economic growth whether it's also significant in the developing countries of south Asia. The previous studies conducted on south Asian countries have used only single proxies, variables and mixed components with traditional models. We employed both static and dynamic models to the panel data for the time of 1980- 2017 to more efficiently estimate this association.

The rest of the study is structured as follows; section 2 present review of relevant literature on finance growth nexus, section 3 is composed on methodology, section 4 shows results and discussion while section 5 conclude the study.

Literature Review

The finance growth nexus has been studied by several researchers for different sample of countries and regions by using different proxies and methods but have got mixed results. Recently a study conducted by Haque (2020) who have studied finance growth relationship and attempts to assess the role of financial development towards the growth of the private sector. They have found positive impact of financial development on economic growth, trade openness and government expenditure while the private sector's gross domestic product has been found to be negative related with money supply, positive associated with bank credit to private sector while not significant for share market capitalization. Similarly, Bist (2018) have studied financial development and economic growth in low-income countries by employing FMOLS and DOLS models. Their results evidence the existence of long run cointegrating association. The author further statues that financial development has positive and significant impact on economic growth in the long run. Likewise, Rahman et al (2020) studied finance growth nexus in Pakistan for the period of 1980 to 2017. They have confirmed the Schumpeter view that financial development enhances economic growth. They give strong evidence of positive association between financial development and economic growth. Dritsakis, Kacho and Dahmardeh (2017) have also studied the impact of financial development and institutional quality on economic growth by using dynamic panel data generalized method in Cooperation Organization Countries for the time 2002 to 2014. They have used the mean of opinion and response, political stability and lack of violence, administrative efficiency, quality of provisions and legality and corruption control as six institutional indicators as well as the ratio of available credits for private sector in banks to gross product as finance indicators. Their results indicate that financial development and institutional quality have significant and positive impact on economic growth in selected countries. They have concluded that financial development may cause economic growth in developed countries due to good institutional structure. Similarly, Jauch and Watzka (2016) analyzed this association in developed and developing countries for the period of 1960 to 2008. They have used private sector credit as a proxy for financial development and have applied two stage least square estimation. They have found positive impact of financial development on income. Elkhuizen et al (2018) have studied the relationship between financial development, financial liberalization and social capital by using panel data of 82 countries for the time period 1973–2008. They have found that social capital may substitute for formal institutions as a prerequisite for effective financial liberalization policies. Their result shows that during the post Washington-consensus period countries with a high prevailing level of social capital can ensure that financial

liberalization positively influences financial development, despite the poor quality of their formal institutions. De Haan and Sturm (2017) examined financial development, banking crises and liberalization. They have found that financial development conditions the impact of financial liberalization on income inequality. More recently, Opoku, Ibrahim, and Sare (2019) have used frequency domain approach to study the linkage between financial development and economic growth in African countries over the period 1980–2016. They found that even though there is some evidence of demand-following, supply-leading and feedback hypotheses, to a large extent, financial development and economic growth evolve independently, irrespective of the time period. Law, Lee, and Singh (2018) examined the nonlinear nexus between financial development and innovation using GMM estimators. Although the authors found an inverted U-shaped relationship between finance and innovation, further results from their study show that the finance–innovation link varies with the level of institutional quality. In particular, for countries with sound institutions, the finance–innovation relationships followed an inverted U-shaped relationship, suggesting that sound institutional quality is a prerequisite for beneficial effects of financial development. Moreover, Arayssi and Fakih (2017) examined the causal link between financial development and economic growth in Kenya over the period 1960–2013. Results from their study reveal that although financial development is a by-product of growth, the interaction between foreign direct investment and financial development causes growth. However, in the case of South Africa. Sohag, Shams, Omar, and Chandrarin (2019) studied finance growth nexus in Malaysia and Indonesia. Their findings show an inverted U-shaped relationship between finance and growth in Malaysia. A U-shaped link was found for Indonesia. However, a positive change in institutional quality was found to have a much greater impact on growth rather than playing a mediating role in Malaysia. Interestingly, in Indonesia, the institutional quality was found to hinder economic growth, but it played a positive and significant mediating role in the finance–growth relationship. Law, Kutan et al. (2018) states the positive role in presence of institutions of financial development in economic growth. Relying on data from 87 countries spanning 1984–2014 while

employing the dynamic panel GMM estimators, empirical results of Law, Kutan et al. (2018) show that the finance measured by private sector credit, liquid liabilities, and domestic credit drags overall growth when institutions are weak. Thus, institutions play a crucial role in the financial development–growth nexus, with economies having better institutional quality gaining significantly from banking sector development.

Methodology

Empirical model specification and variables

The current study explores the impact of banks based financial development and market based financial development on economic growth in four south Asian developing countries namely Sri Lanka, Bangladesh, India and Pakistan for the period of 1980 to 2017. Data for all variables were downloaded from the World Bank world Development Indicator. Bank based proxies' variables used in the study are credit to private credit, broad money (M2) and domestic credit by banks (DCB). On the other hand, market-based variables used to proxy financial development (MBFD) are; the total stocks traded value, stock turnover ratio and market capitalization while economic growth is proxy by per capita GDP. Other control variables were added are inflation, trade openness and capital formation. The econometric model can be written as follows;

$$GDPPC_{it} = \beta_0 + \beta_1 GDPPC_{it-1} + \beta_2 FD_{it} + \beta_3 TO_{it} + \beta_4 INF_{it} + \beta_5 INV_{it} + \epsilon_{it} \dots \dots \dots \dots \dots \dots \dots .1$$

Where, GDPPC is GDP per capita used as a proxy of economic growth, $GDPPC_{i,t-1}$ is the first lag of all left-hand side variables given in the equation is utilized as an explanatory variable to quantify the effect of the anterior years on the current year. FD represent both markets based financial development and bank based financial development, TO is Trade openness, INF represent Inflation, INV is investment calculated as capital formation while ε is the error term. The summary statistics of the study variables is presented in table 1.

Table 1. Summary of Statistics and variables description

Variable	Description	Mean	Median	Std. Dev.	Min	Max
GDP	Per capita gross domestic product	3.472	3.324	2.143	-2.227	8.556
STRD	Value of stocks traded	7.258	28.507	100.198	0.000	467.949
MKT	Sock market capitalization	30.371	23.348	27.243	1.399	149.506
FDPVT	Credit to private sector	28.172	25.740	10.461	8.821	52.385
BM	Broad money	46.141	44.144	14.461	19.592	79.075
LB	Liquid liabilities	39.460	37.785	13.663	15.390	74.926

TO	Trade openness %GDP	40.582	35.612	18.627	12.219	88.636
CFOR/INV	Fixed capital formation	22.776	23.633	5.548	12.520	35.812
INF	Inflation %GDP	7.975	7.453	4.485	0.155	24.891
STR	Stock turnover ratio	19.943	3.555	30.895	0.0000	143.188

Econometric techniques

Three econometric techniques were employed to reenter the different econometric techniques used in previous studies to examine the linkage of finance and growth. These techniques are OLS, fixed effect and GMM which is proposed by (Arellano & Bond, 1991), system GMM (RW Blundell & Bond, 1995). System GMM is the recent application concerning the theme; therefore, the current study is focusing on the object and result are mostly concern on this. The first phase, the study has made the OLS and FE method estimation which is used for inspecting the issues of heterogeneity of countries.

The GMM techniques is in the first difference and its permit taking to deal with endogeneity problem concerned with variables of the study. This issue intermingled especially in the situation where the study deals the association of finance and economic growth in case of existing the causality with dual implication between finance and growth. System GMM has the ability to deal with the grouping of both difference and equations in level. The Instruments which specified for the difference equations are variables delayed values in levels. Furthermore, the variables of the study are instruments by the level equation and first differences. The system of the equations has been estimated by generalized method of moments simultaneously. The simulation about this of Monte Carlo made by (Richard Blundell & Bond, 1998) stated that SGMM model is efficient the most to estimate this dilemma. The over documentation test is Sargan test replaced as Hansen test and also the serial correlation test of Arellano and Bond are used. Most of the results regarding these tests confirmed our study expectations. Hansen test value gives the acceptance and shows the validity of the instruments. The serial correction tests shows whether the hypothesis is validated of second serial correlation of residuals. In the results of regression, the SD of coefficients are validated and heteroscedasticity problem have been checked. Our findings are consistent with results of King & Levine (1993), Levine (1997), Demetriades & Hussein (1996) and Giuliano & Ruiz-Arranz (2009).

A well-functioning financial sector can positively and strongly contribute to economic growth in both developing and developed countries. Secondly, the study employs panel co-integration techniques. The panel co-integration techniques used in the study is (FMOLS) (Pedroni, 2004) and (Phillips & Hansen, 1990) to explore bank based and market based financial development relation with growth. Dependent and independent variables are used and estimated the relationship of economic growth with financial indexes. The dependent variables in the models is economic growth and the financial development variables have constructed two indexes FDB and FDM where both indexes are proxied with three variables each as explained above.

Results and discussions

Panel Unit root test

Before doing analysis of the models, the data stationary properties have been checked by using different tests of unit root for panel data. Different scholars such as Breitung (2000), (Im, Pesaran, & Shin, 2003) and (Levin, Lin, & Chu, 2002) have established some tests for checking the stationary in panel data similar to other tests of unit root which have been conceded out in previous literature mostly for single series. The panel unit root tests power and ability is higher than other unit root tests which have been employed for individual time series since its bring evidence together in the series along with the evidence in the data which is cross section data. Following tests are tested for all the study variables. The results of Breitung panel unit root test as well Persaran and shin and LLC tests indicates that when the variables of the study are tested in levels can't reject the null hypothesis of unit root while only two variables such as GDPPC and inflation reject the null hypothesis in level. However, most of in the first differences, the non-stationary hypothesis is rejected at 1 percent level of differences. These results indicates that our data series are pigeonholed as an I (1) process for all variables while GDPPC and inflation are considered in 1(0) processes.

In the table, column 1 indicates variables names, column 2, 3, and 4 present the different unit root tests and t-statistics both in levels and in first differences such as LLC, Persaran and shin, and Breitung unit root tests respectively. In the present study, the null hypotheses are rejected based

on the outcomes of panel unit root tests. However, the unit root test indicates the acceptance of alternative hypothesis. The unit root tests results indicates that there is at least one of the unit root test which shows the non-stationary of the data in panel level of series where all the test of unit root indicates the panel series stationary. In the present study, the results of all tests of panel unit root tests provide strong support that the series of the data is stationary and therefore the null hypotheses have been rejected of the given p- value of the unit root tests. The results of panel unit root test are given in table 2.

Results of Panel co-integration

The results of panel unit root tests allow us further to test the panel co integration. Therefore, the current study employed the panel cointegration test of Pedroni (2004) where this test is composed of seven tests of statistics. The

test for panel co integration has been tested to determine that if there exist long run equilibrium association between variables. Seven tests of cointegration have been employed to examine the hull hypothesis of no cointegration. The results of co integration indicate that most of the results reject the no co integration null hypothesis mostly in all models. Table 3 represent the panel cointegration results for bank-based variables while table 4 shows the results of panel cointegration for market-based variables. Since, the variables are cointegrated for both banks based and market-based variables, therefore the results allow us for long run estimations. After the establishment of unit root and cointegration, the next step is to estimate the associated long-run cointegration parameters. The estimated results of Fully Modified OLS and the Dynamic OLS are reported in the table below. The findings show that most of the results of FMOLS and DOLS are the same for each variable.

Table 2. Panel Unit Root test results

Variables	Levin, Lin &Chu		Pesaran and Shin		Breitung	
	Level	1st Difference	Level	1st Difference	Level	1st Difference
GDPPC	-4.594***	-10.199***	-5.409***	-9.659***	-5.034***	-6.737***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
FDPVT	-0.519	-6.057***	0.296	-4.707***	0.422	-3.527***
	(0.301)	(0.000)	(0.616)	(0.000)	(0.663)	(0.000)
BM	0.206	-7.836***	-0.256	-6.226***	0.993	-6.220***
	(0.581)	(0.000)	(0.398)	(0.000)	(0.839)	(0.0031)
M3	0.968***	-2.639***	1.002	-2.722**	0.680	0.095***
	(0.000)	(0.000)	(0.841)	(0.003)	(0.752)	(0.000)
STRD	-2.736***	-4.076***	-1.484	-3.282***	-1.602	-3.324***
	(0.003)	(0.000)	(0.068)	(0.000)	(0.054)	(0.000)
STOR	-0.715	-5.440***	-0.398	3.843***	-1.936	-4.985***
	(0.237)	(0.000)	(0.345)	(0.000)	(0.026)	(0.000)
MKT	-2.560**	-7.796***	-1.601	-6.218***	-1.645	-6.206***
	(0.005)	(0.000)	(0.054)	(0.000)	(0.049)	(0.000)
TO	1.749	-8.999***	1.402	-8.275***	1.305	-6.528***
	(0.959)	(0.000)	(0.919)	(0.000)	(0.904)	(0.000)
INV	-2.204	-6.562***	-1.974	6.685***	-2.842**	-4.338***
	(0.013)	(0.000)	(0.024)	(0.000)	(0.002)	(0.000)
INF	-3.699***	-14.82***	3.950***	-15.343***	-2.350***	-7.755***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.009)	(0.000)

Table 3. Result of Panel Co-integration for bank based financial development

Bank Based Financial Development					
FDPVT		BM		L.Laib	
	Weighted statistics		Weighted statistics		Weighted statistics
Statistic	statistics	Statistic		Statistic	
Panel V 5.185***	4.828***	-3.131***	4.607***	4.406***	3.644**
(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Panel rho -6.943***	-7.350***	-3.131***	-7.810***	-5.769***	-5.450***
(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Panel PP -7.695***	-7.691***	-3.131***	-7.793***	-6.547***	-5.264***
(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Panel ADF -2.894***	-3.131***	-3.131**	-2.344**	-2.088**	-1.507***
(0.000)	(0.000)	(0.001)	(0.009)	(0.001)	(0.006)
Group rho -6.295***		-3.131***		-4.192***	
(0.000)		(0.000)		(0.000)	
Group PP -9.681***		-3.131***		-6.735***	
(0.000)		(0.000)		(0.000)	
Group ADF -1.33**		-3.131		-1.424**	
(0.009)		(0.015)		(0.007)	

Note: FDPVT represent credit to private sector, BM is broad money, L.Laib is liquid liabilities, *** and ** represent significance level at 1% and 5 percent respectivel

Results of Fully Modified Ordinary Least Square (FMOLS)

Table 5 represent the results of bank based financial development (FDB) index and market based financial development (FDM) index where the FDB index is highly statistically significant at 1 percent level which indicates that FDB index effect economic growth positively in the sample countries in the long run. More specifically, if there is a percent increase in FDB will increase economic growth by 2.3 percent in the long run. The results indicate that FDB index constructed of three banks development indicators collectively important for economic growth of the sample countries. The finding of the current study is reinforced by the study of other researchers such as the study of (Guru & Yadav, 2019) who have also

Table 4. Result of Panel Co-integration for Market based financial development

Market Based Financial Development					
STOR		STRD		MKT	
	Weighted statistics		Weighted statistics		Weighted statistics
Statistic		Statistic		Statistic	
Panel V-St 2.650**	1.458**	4.043***	0.108	5.672***	0.019
(0.004)	(0.007)	(0.000)	(0.456)	(0.000)	(0.045)
Panel rho-st -2.650***	-2.982***	-3.726***	-1.106**	-5.236***	-2.916**
(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
Panel PP-st -7.849***	-5.673**	-3.930***	-1.492**	-4.990***	-3.010**
(0.000)	(0.001)	(0.000)	(0.006)	(0.000)	(0.001)
Panel ADF-St 1.243	1.315	-2.178**	-1.030**	-0.896**	-1.513**
(0.08)	(0.090)	(0.001)	(0.001)	(0.001)	(0.006)
Group rho -1.52***		-1.761		-2.455**	
(0.006)		(0.003) **		(0.007)	
Group pp -6.592***		-3.974***		-4.494***	
(0.000)		(0.000)		(0.000)	
Group ADF 1.847		-2.668**		-0.071**	
(0.096)		(0.003)		(0.008)	

Note: STOR is stock turnover ratio, STRD is the total value of stocks traded, MKT is stock market capitalization, *** and ** represent significance level at 1% and 5 percent respectively

studied the same association and found that banks exert positive impact on growth level in BRICS economies. Similarly, the study of (R. Levine & Zervos, 1998) is also similar to the findings of our study as they found that the growth of banking industry predict the level of economic growth positively. Banks plays a leading and appropriate role in promoting financial development by mobilizing financial resources of the public and makes them available

for investment in productive enterprises. Bank credit increases the speed of economic development progress of a country by providing loan to industries in time. Similarly, economic growth encourages credit expansion through its demand for financial services. The relationship between bank and economic growth is of practical significance in policymaking. The financial efficiency is the ability to perform as a major role of deposits transformation to credits (Asongu, 2012).

Investment, which is calculated as a gross capital formation is also highly significant and positive which also exert positive impact on economic growth in the long run while the other two control variables trade openness and inflation are insignificant. The results of gross capital formation indicate the importance of investment in public and private productive sectors because it enhances economic growth.

Table 5. FMOLS Model results

FMOLS Regression		
	FDB index	FDM index
FD	2.362***	0.010**
	(0.000)	(0.003)
INV	0.160***	0.0256**
	(0.000)	(0.005)
TO	-1.558	0.0273***
	(0.036)	(0.000)
INF	-0.345*	-0.0380***
	(0.078)	(0.000)

Note: The tables present the results of FMOLS (fully modified ordinary least square) results. ***,** represent the level of significance at 1 and 5 percent respectively

In case of the current study findings, the investment variable is positive and highly significant in all the study models and this result is confirmed by the theory of growth which emphasized the necessity of investment in economic growth though capital accumulation in augmenting economic growth. Similar results to the present study findings have found by (Nyasha & Odhiambo, 2014), (Effiong, 2015) and (Bist, 2018).

The insignificant result of inflation infers that increase in inflation level cause to decrease economic growth insignificantly in four south Asians developing countries (Pakistan, Sri Lanka, India and Bangladesh). Inflation in the present study has been as a control variable which is the macroeconomic stability proxy and the result is consistently negative in all models of the present study. This negative result of inflation coefficient is consistent with the macroeconomic instability argument which indicates that inflation is poisonous to economic growth.

Inflation lowers the long-term rate of investment and the level of higher inflation increase risks and also increases the uncertainty in an economy. The whole result of FDB indicates that all three bank-based variables collectively enhance economic growth in the long run which indicates that development in banking sector of the sample countries will spur economic growth.

Likewise, FDM index is also highly significant which shows that its impact on economic growth positively. Stock and bond markets works as a motivator and driving the economic activity through resource allocation and saving mobilization as well the managing of corporate side and risk management, that system of the economy is called a market-based financial system and financial market development is called the market-based financial development (Demirguc, Kunt and Levine, 2001). The positive impact of stock market development on economic growth in the model indicates that stock market development is very important for economic growth in the sample countries. For instance, if there is a percent increase in FDM will increase economic growth by 0.01 percent in the sample countries in the long run. Stocks markets offer various services to stock market participants and reached to the investors around the globe. Similarly, a stock traded volume is considered as an indicator of stock market development since stock prices need volume to move. The stock prices high volatility arises due to the volatility volume and the activities relating to trading. Therefore, the current study results suggest that increase in the performance of stock markets in the sample countries will lead to higher economic growth. The same results on the impact of stock market development on economic growth were found by (Carp, 2012), (Le, Ho, & Vu, 2019) (Azam, Haseeb, binti Samsi, & Raji, 2016), Masoud 2013, (Enisan & Olufisayo, 2009) and (Nyasha & Odhiambo, 2015).

Similarly, other control variables which are investment, trade openness and inflation are also significant determinant of economic growth in the FMOLS regression which indicates that trade openness and gross capital formation will positively impact economic growth in the long run. Results regarding capital formation empirically proved that gross capital formation (investments) are positively interrelated with economic growth which indicates that higher amounts of investments carried out by investors enhance goods and services and increase economic growth progress. The results confirm that investment is the main factor of economic growth and the same findings to the present study are also found by (Caporale, Rault, Sova, & Sova, 2009), Van de Laan et al.,

(2011) and Ahmed (2013). Moreover, (Romer, 2012) also statues that an increase in the level of investment bring increase in economic growth.

Regarding trade openness, the same result is found by (Murari, 2017) by using FMOL and DOLS. Furthermore, (Ahmed Abdullahi, 2011) have also used FMOLS and found the same result that market-based financial system is crucial for explaining output growth. The source of economic growth is openness of a country as its considered by numerous studies such as the study of (Thorsten Beck & Levine, 2004), (Salgado-Banda, 2005) and (R. Levine & Zervos, 1998). These researchers have confirmed that the economic growth and trade openness relationship is positive in developed as well in the developing countries.

Dynamic Ordinary Least Square (DOLS) estimation

As the current study used the FMOLS long run estimator, the study further employed DOLS estimators as a robust check which is recommended by Kao and Chiang (2000). DOLS method is a parametric method which take potential endogeneity into consideration of the variables as well as the presence of serial correlation by including the lags and leads of difference explanatory variables as additional regressors in the model (Fidrmuc, 2009;441). In this context, Kao and Chiang (2000) indicates that DOLS is better as compare to FMOLS and its outperform than FMOLS when estimating co integration of panel regressors. Therefore, we used DOLS method after using FMOLS to further confirm the results as a robust check.

Same as the FMOLS, table 6 shows the impact of FDB and FDM indices on economic growth by using dynamic OLS model. The estimated coefficient of FDB index which is constructed of three bank based financial development indicators is highly statistically significant and positive which indicates that increase in these three indicators collectively exert positive impact on economic growth in the long run. More specifically, if there is a percent increase in FDB index will enhance economic growth by 0.087 percent in the long run in the sample countries.

Table 6. DOLS model results

DOLS Model Results		
	FDB index	FDM index
FD	0.087***	-44.296***
	(0.000)	(0.000)
INV	0.193***	2.625***
	(0.000)	(0.000)

TO	-0.017***	17.743***
	(0.001)	(0.000)
INF	-0.2620	8.968***
	(0.295)	(0.000)
R^2	0.395250	-512.4

Note: The tables present the results of DOLS (Dynamic ordinary least square) results. FD is financial development, FDB is bank based financial development index, FDM is stock market based financial index, while ***,** represent the level of significance at 1 and 5 percent respectively

Similarly, investment which is a control variable also exert positive significant impact on economic growth which indicates that this variable also increases economic growth in the long run in the sample countries while trade openness will reduce growth rate in the long run. Inflation has been found to have insignificant impact on economic growth.

Likewise, FDM index which is constructed of three market-based indicators has a negatively significant impact on economic growth while this index was found positive significant in FMOLS model. This result indicates that FDM index is negatively significantly related to economic growth in the long run in the sample countries while investment, trade openness and inflation which are the control variables have been found to be positively significantly associated with economic growth in the long run. The negative impact of FDM index in the DOLS model is a robust check as this result is positive in the FMOLS model. This result indicates that the countries should focus on the importance of stock market development which will also in turn contribute to economic growth in the long run.

Results of Static and Dynamic Models on the impact of Bank based financial development on Economic growth

The results of OLS, FE, difference GMM and System GMM dynamic panel estimators with regard to financial development by banks (FDB) for four south Asian developing countries (Pakistan, Sari Lanka, India and Bangladesh) are given in Table 7. The results show that the lagged dependent variable is highly significant and finance growth results gives evidence of positive and significant association in the study sampled countries. Three proxies variables are used for bank based financial development index. These variables are Broad Money (BM) which has also known as M2, Liquid liabilities (M3) and private sector credit by Banks (FDPVT) are used to investigate the banks development role in economic

growth. The index of bank based (FDB) is highly statistically significant and the relationship is positive with economic growth which states that all these three bank proxies of financial development are quite fit to explain financial development and it's positively and significantly contribution to economic growth.

The estimated coefficient of FDB index in all models (OLS model, fixed effect method and system GMM regarding) is positive and highly significant at one percent significant level on economic growth. For instant, the results of system GMM indicate that if there is 1% rise in FDB index cause to increases economic growth in the sample countries by 0.46 percent. It is noted that the bank-based index coefficient distributed by financial institutions and banks to private sector is positive and significant. These observations can be associated directly to the south Asian countries predominant public sector in the process of credit allocation. Accordingly, to the credit allocation process improvement, these countries of south Asia further need the national banks privatization or the regulations reinforcement of credit and the banking sector competition.

Our result of this study is reinforced by the study of other researchers such as the study of (Guru & Yadav, 2019) who also have studied the same association and have found that banks exert positive impact on growth level in BRICS economies. Likewise, (R. Levine & Zervos, 1998) also support the study findings as they found that the growth of banking industry predict the level economic growth positively. The current study findings can be implemented in the sampled countries as the findings suggest that there is passionate need for financial development specifically the banking sector in order to super the study sampled countries economic growth.

Table 7. Bank Based Financial Development and Economic Growth

Dependent variable	Model-1	Model-2	Model-3	Model-4
GDP Per Capita	OLS	FE	GMM	SGMM
FDB	0.680***	0.670***	0.679**	0.466***
	(0.174)	(0.247)	(0.277)	(0.129)
Trade Openness	0.365***	0.258	0.362	0.228**
	(0.110)	(0.203)	(0.324)	(0.0872)
Investment	0.279***	0.205***	0.162***	0.156***
	(0.0784)	(0.0772)	(0.0551)	(0.0564)
Inflation	0.00229	0.00427	0.00695	0.00873
	(0.0122)	(0.0118)	(0.0110)	(0.00867)
L.GDP Per Capita			0.0283	0.290***
			(0.100)	(0.0824)
Constant	-3.082***	-2.524***		-1.922***
	(0.727)	(0.717)		(0.557)
Observations	97	97	73	91
R-squared	0.338	0.274		
Number of id		4	4	4
Sargan test				79.40 (0.651)
AR2				0.48 (0.628)

Source: Own calculation

Notes: FDM is market based financial development index. OLS is ordinary least square, FE is fixed effect model, and GMM and SGMM are difference and System Generalized method of Moments. *, **, *** represents significance level at 10, 5% and 1% respectively.

The development of institutions deals with microfinance as an accompaniment to the conservative commercial banks and it will perform vital part in saving mobilization and ease access to fund provision and then in turn it can increase the growth progress of the sampled countries. Similarly, the estimated coefficient of trade openness in OLS and System GMM models are highly statistically significant at 1 percent and five percent level which statues that the need of trade openness is important and it perform positive role in economic growth in the sampled countries of the present research. The trade openness of an economy has been considered as the important source of economic growth by several researchers such as (Salgado-Banda, 2005) (Thorsten Beck & Levine, 2004) and (R. Levine & Zervos, 1998). These scholars have conferment that the association of growth and openness in developing countries as well in developed countries is positive and significant.

According to the study of (Salgado-Banda, 2005) where he statutes that economic liberalization and the trade

freedom have an essential role to augment the efficient resource allocation in an economy which in turn facilitate and augment the level of economic growth. Additionally, some other researchers such as Helpman and Krugman (1969) and (Krueger, 1997) have portrayed the import substitution policies inefficiencies and further mentioned that trade openness move inefficient import substitutions activities resources to efficient and comparative advantage side. Similarly the study of (Deyshappriya, 2016) have also found positive and significant impact of trade openness on economic growth in a study conducted on developing and emerging markets which are similar to the present study findings. The result further proves that the trade of sampled four countries has been enhanced at high level and states about the financial system, governance and corruption. It can be positive and significant also due to high amount of FDI inflow which can be the result of high economic growth. Therefore, it is suggested that these four countries should focus to further stabilize their financial system and others factors such as good governance, corruption and political stability in order to promote trade openness which in turn can stimulate economic growth. Moreover, the results also suggest that these four countries should focus on industrial productions in the presence of good governance which can help increase export as a results economic growth magnificent. Likewise, the estimated coefficient of investment is significant highly at 1 percent level and positive in all models which indicate that investments are very important in enhancing economic growth in the sample countries of the current study. Investment variable is measured in the study by the fixed capital formation which exert significant and positive impact on economic growth which indicates the importance of investment in public and private productive sectors because it enhances economic growth. In case of the current study findings, the investment variable is positive and highly significant in all the study models and this result is confirmed by the theory of growth which emphasized the necessity of investment in economic growth though capital accumulation in augmenting economic growth. Similar results to the present study findings have found by (Nyasha & Odhiambo, 2014), (Effiong, 2015) and (Bist, 2018). Moreover, the estimated coefficient of inflation is highly statistically insignificant and the relationship is negative with per capita growth. This result infers that increase in inflation level cause to decrease economic growth insignificantly in south Asians four countries (Pakistan, Sri Lanka, India and Bangladesh). Inflation in the present study has been as a control variable which is the macroeconomic stability proxy and the result

is consistently negative in all models of the present study. This negative result of inflation coefficient is consistent with the macroeconomic instability argument which indicates that inflation is poisonous to economic growth. Inflation lowers the long-term rate of investment and the level of higher inflation increase risks and also increases the uncertainty in an economy. Whenever explaining economic growth in a study, the important factor of explaining economic growth is inflation and shouldn't be ignored. Moreover, the study of other researchers namely (Ireland, 1994) and (Deyshappriya, 2016) have got the insignificant values for inflation which strained that the inflation influence on economic growth is low extensively and this impact may completely perish in the long run. Similarly, (Tripathy, 2019) have also obtained that there is negative association of inflation and economic growth in a study conducted for India. Similarly, an another study of (Effiong, 2015) have also found negative role of inflation in economic growth.

The whole results designate that banks development have a positive and significant influence on economic growth in the present study sampled countries which further suggest that if there is an increase in banking sector performance will leads to higher economic growth in four south Asian developing countries. The results of the current study are reinforced by different researchers such as (Andersen & Tarp, 2003).

The effects of Market-Based Financial Development on Economic Growth

Table 8 provides the results of all models OLS method, fixed effect estimator, difference GMM and system GMM estimators. The first column of table presents the variables, OLS and fixed effect model results are given in column 2 and column 3 respectively, while the difference GMM and system GMM results are given in column 4th and column 5th respectively with regard to financial development by stock market in four South Asians countries (Pakistan, Sri Lanka, India and Bangladesh) are given.

The table 6 below results shows the positive and significant coefficient of lagged dependent variable. The study findings of stock market and economic growth are significant and the relationship is positive in all the study employed models which indicates that the three proxies used for stock market growth collectively exert positive and significant role in economic growth.

The results of FE, difference GMM and system GMM dynamic panel estimators for South Asians four countries

(Pakistan, India, Bangladesh and Sri Lanka) are given in table. The system GMM result of stock market development index is highly statistically significant at 1 percent level, OLS and fixed effect model at 5 percent level while difference GMM at 10 percent level confirming that market based financial development stimulates economic growth of sampled south Asian's countries. After the potential endogeneity control of explanatory variables, the results concludes that the index of stock market (FDM) exert positive influence on economic growth in the study sample. The finding of current study re-enforced by the studies of (Carp, 2012), (Azam et al., 2016), Masoud 2013, (Enisan & Olufisayo, 2009), (Nyasha & Odhiambo, 2015). Moreover, similar results to the current study findings were also found by (Le et al., 2019) in three Asian countries regarding stock market and economic growth. These findings indicates that there is an important role of stock markets growth in financial development proxies by market based financial indicators with liquidity, capital adequacy and investments as well economic resources mobilization in an inefficient way. Furthermore (Thorsten Beck & Levine, 2004), (Deyshappriya, 2016), (Rousseau & Wachtel, 2000) have also found the positive role of stock markets in economic growth. Moreover, stock market advancement also assists in capital accumulation which can allow small investors which invest financial assets in the capital markets such as investment in bonds, stocks and debenture. According to the results of this study, well preforming and developed stock markets are key indicators of macroeconomic development because it can motivate domestic and foreign investors for investment into the country which is an energizer for industrialization (Coskun, Seven, Ertugrul, & Ulussever, 2017), (Petros, 2012) and (Cooray, 2010)

Table 8. Results of Market-Based financial development and Economic Growth

Dependent variable GDP Per Capita	Model-1 OLS	Model-2 FE	Model-3 GMM	Model-4 SGMM
FDM	0.148**	0.355**	0.0989*	0.105***
	(0.0691)	(0.133)	(0.0766)	(0.0307)
Trade Openness	0.725***	0.622	0.135	0.390***
	(0.222)	(0.395)	(0.256)	(0.114)
Investment	0.396***	0.231*	0.199***	0.188***
	(0.115)	(0.122)	(0.0549)	(0.0524)
Inflation	-0.117	-0.112	-0.0767*	-0.0395
	(0.0904)	(0.0906)	(0.0440)	(0.0396)
L.GDP Per capita			0.107	0.358***
			(0.0874)	(0.0698)
Constant	-2.374***	-2.150		-1.105***
	(0.809)	(1.490)		(0.391)
Observations	58	58	43	56
R-squared	0.380	0.252		
Number of id		4	4	4

Source: Own calculation

Notes: FDM is market based financial development index. OLS is ordinary least square, FE is fixed effect model, and GMM and SGMM are difference and System Generalized method of Moments. *, **, *** represents significance level at 10, 5% and 1% respectively

Moreover, income per capita is also the growth regression common factors where the present study has got that the stock market and per capita GDP have positive association. The current study findings are consistent with other studies results such as the study of (Thorsten Beck & Levine, 2004; Deyshappriya, 2016), (Salgado-Banda, 2005) and (Seetanah, Ramessur, & Rojid, 2009) and (R. Levine & Zervos, 1993) and (Osinubi, 2002). Additionally, the

present study findings are in line with the previous arguments which are that sound financial sectors of a country contribute to economic growth significantly. More specifically, if there is 1% increase in the financial development will implies 0.1 percent increase in economic growth level as obtained by the results of system GMM. Similar findings to the current study have found by several scholars on the relation of finance and economic growth which reinforce the findings of the present study such as (Nyasha & Odhiambo, 2015), (Alimi, 2015), (Sahoo, 2014), (Adu, Marbuah, & Mensah, 2013), (R. Levine, 2005), Levine and Zervos (1996) and Hassan *et al*., 2011. A well-established financial system of countries plays a crucial role to boost economic growth resulting good living standard and prosperous countries. Similarly, the result of openness in OLS and system GMM is significant highly and the relationship is positive which reveal that trade openness of trade among four countries is performing well. System GMM result indicates that if there is 1 percent increase in trade openness will raise the growth rate by 0.105 percent. In additions, the source of economic growth is openness of a country as its considered by numerous studies such as the study of (Thorsten Beck & Levine, 2004), (Salgado-Banda, 2005) and (R. Levine & Zervos, 1998). These researchers have confirmed that the economic growth and trade openness relationship is positive in developed as well in the developing countries. As the author (Salgado-Banda, 2005) states that liberalization and openness to trade of a country enhance the level of resource allocation efficiency and then its upsurge the growth level. Similarly, the current findings are also reinforced by other researchers such as Helpman and Krugman (1969) and (Krueger, 1997).

Investment coefficient is also highly significant in all models. The current results empirically proved that gross capital formation (investments) are positively interrelated with economic growth which indicates that higher amounts of investments carried out by investors enhance goods and services and increase economic growth progress. The results confirm that investment is the main factor of economic growth and the same findings to the present study are also found by (Caporale et al., 2009), Van de

Laan et al., (2011) and Ahmed (2013). Moreover, (Romer, 2012) also statues that an increase in the level of investment bring increase in economic growth. Likewise, the estimated coefficient of inflation is statistically significant only in GMM model and the relationship is negative which implies that a 1% increase in inflation cause to decrease economic growth in south Asians four countries (Pakistan, Sri Lanka, India and Bangladesh). Nevertheless, the coefficient of inflation in other models is insignificant. However, inflation is became an insignificant factor for economic growth which means that inflation reduce the growth rate. (Ireland, 1994) and (Deyshappriya, 2016) have also got the same results to the current study findings. It can be concluded that financial sector gets worse when there is high inflation and it can cause reduce the economic performance.

Robustness checks

Robustness check-I

Table 9 present the results of robustness check. To check the validity of the above results, we have used system GMM where financial development-I is the banking sector and financial development-II is the stock market financial development. Each indicator in same regression model without constructing an index has been used where most of the indicators exert the same impact on economic growth as in the results of FDB and FDM index.

Robustness check-II

To further confirm the empirical results of the analysis and robustness purpose, they study have used system GMM and reexamine by using each individual indicators as a single proxy in the model rather than a composite index and have done analysis where all the indicators of both banks and stock market exactly has the same impact on economic growth as in the two-bank based and market based financial development indexes and other models. The results are given in below table 10 where financial development-I represent banks indicators while financial development-II illustrates the stock market indicators.

Table 9. Robustness check-I

VARIABLES	Financial Development-I	VARIABLES	Financial Development-II
L.GDP per capita	0.237***	L.GDP per capita	0.339***
	(0.085)		(0.074)
Private credit	0.027***	Mkt Capitalization	60.66*

	(0.150)		(30.22)
Broad money	0.025**	Turnover ratio	60.76*
	(0.012)		(30.23)
Liquid liabilities	1.445**	Value trade	-60.74*
	(0.549)		(30.23)
Trade openness	0.377***	Trade openness	0.383***
	(0.107)		(0.126)
Investment	0.156***	Investment	0.218***
	(0.056)		(0.058)
Inflation	0.002	Inflation	-0.044
	(0.052)		(0.042)
Constant	-4.816***	Constant	278.6*
	(1.533)		(139.2)
Observations	91	Observation	56
Number of id	4	Number of id	4

Note: *, **, *** represents significance level at 10, 5% and 1% respectively

Table 10. Robustness check-II

	Financial development-I			Financial development-II		
Dep.var GDPPC	FDPVT	BM	LQ	MKT	STOR	STRD
Finance Indicator	0.366***	0.450***	0.443***	0.103***	0.003***	0.050**'
	(0.103)	(0.125)	(0.118)	(0.033)	(0.001)	(0.025)
Trade Openness	0.247***	0.272***	0.266***	0.349***	0.428***	0.434***
	(0.088)	(0.089)	(0.088)	(0.116)	(0.109)	(0.121)
Investment	0.163***	0.181***	0.159***	0.191***	0.154***	0.184***
	(0.057)	(0.057)	(0.056)	(0.054)	(0.054)	(0.055)
Inflation	0.021	0.032	0.008	-0.021	-0.030	-0.028
	(0.051)	(0.052)	(0.008)	(0.040)	(0.042)	(0.041)
L.GDPPC	0.192**	0.196***	0.287***	0.358***	0.352***	0.392***
	(0.073)	(0.074)	(0.082)	(0.069)	(0.072)	(0.072)
Constant	-1.377***	-2.041***	-1.988***	-1.049**	-1.001***	-1.229***
	(0.406)	(0.542)	(0.556)	(0.395)	(0.373)	(0.429)
Observations	99	99	91	60	66	56
R-squared						
Number of id	4	4	4	4	4	4

Note: *, **, *** represents significance level at 10, 5% and 1% respectively

Conclusions and Policy Implications

This portion of the study illustrates the policy impaction of the study and conclusion. As mentioned earlier, the study explores banks and stock market financial development dynamic impact of south Asian four countries (Pakistan, India, Bangladesh and Sri Lanka) on economic growth. The time period for data of this study is 1980-2017.The majority of the previous conducted studies on finance growth association have focuses mainly or only

the banks development on economic growth and have given a little focus to stock market contribution to economic growth and vice versa. Some of the empirical studies are inconclusive and only few studies have been conducted for these countries used in our study. However, there are some studies on these countries but inefficient and have used mixed or few proxies of financial development. The present study utilizes multiple models such as OLS panel estimator, Fixed effect, FMOLS, DOLS models as well newly developed dynamic models such as Generalized method of moments to examine this

relationship. All other models have been used for comparison while the main focus is system GMM because it's given efficient estimation for the panel data. Totally, in our findings the null hypothesis is strongly rejected which favors that there is no importance of financial development for growth. By using multiple models in the study, the null hypothesis which favor the unimportance of finance in growth have been rejected. The data of the study is consistent with theories after we control for potential endogeneity and country specific effects. The data with theories are consistent which emphasize that financial development is important for growth proxies by FDM and FDB indexes of stocks market and banks development.

This study further suggests that the promotion of financial development of an economy shouldn't be ignored in order for the augmenting high economic growth. Similarly, as FDM the banks development role in economic growth should also not be ignored and both FDM and FDB in the study counties should be considered with full attention to improve because the findings of this study indicates that both FDM and FDB are closely important in economic growth of these countries and no one of them should be ignored. Beside that its further recommend the study countries to focus on the improvement on the individual indicators of financial development that can even be a bank or stock market indicator used in this study has found in the result that each individual indictor is important and contribute to economic growth significantly. Future direction of this study recommends that institutional quality and governance should also be considered to find the role of financial development on economic growth. The limitation can be the follows, the first one is that the study sample size is small and it may suffer the result due to the problem of insufficient data. Although the use of dynamic models' difference and system GMM approach might have need more cross-sectional observations, it may also be argued that a minimum observations and short time period could influence the study findings. Moreover, the precision of parameter may have reduced due to the utilization of annual data. Quarterly data maybe more suitable for such kind of studies but most of the study variables quarterly data were not available. It will be really interesting if compare future findings of studies which have used quarterly data or more data points of different regions which large sample. Moreover, future direction of this study recommends that institutional quality and governance should also be considered to examine finance growth nexus. Other relevant variables should be considered by future studies such as institutional quality, governance and corruption as our study haven't concluded these variables here. If further study used these variables and will observe if the results are better and fundamentally different from the results we obtained for the present study. Furthermore, the present study has used FDB index for measuring financial development where it's been constructed by using three banks development indicators. Similarly, the study has utilized FDM index on stock market development which is also constructed by using three indicators of stock market development.Beside that this study has also found the individual indicators role in economic growth in the sample countries of the present study.

Studies of other researches to be conducted in the future can also benefit by using indexes of financial development by using various indicator rather than used in this study. The study used the panel data obtained from (WDI/WB) world development indicator issued by World Bank. Therefore, the findings and conclusion validity of this study is limited to the credibility of the data used. Study collected by different sources and reliable organization for coming studies are recommended here and suggests conducting a study on the sample countries by using firm level data. However, the empirical findings and evidence of this study could have affected by the study limitation but we assume that these are minimal influences and significantly and theoretically have not been affected our empirical results of the study.

Conflict of Interests

The authors declared no conflicts of interest with regard to publication of this article

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Impact the choice of Exchange Rate Regime on Country Economic Growth: Which anchor Currency leading the 21st Century

Muhammad Naveed Jamil[1]*

[1]Department of Management Sciences, (KFUEIT) Rahim Yar Khan, Pakistan

Corresponding Author: Muhammad Naveed Jamil, mnaveedknp@gmail.com

Abstract

This study provides a comprehensive currencies history of the exchange rate arrangement of 195 countries; exchange rate regime impacts on countries growth and macroeconomic stability period of 1961 to 2020. New measurements of foreign exchange regimes and under controlling the income level of high, upper-middle, middle, and lower-middle economies; This Study adopt Generalized Method of Movements (GMM) to investigate the impact of exchange rate regimes on the economies and macro-economic stability through Per Capita GDP, GDP growth, Inflation and Foreign Trade. The U.S. Dollar dominated currency in world with a high margin. World countries desire to stabilize exchange rates, reduce exchange restrictions and currencies influence. We find that post Bretton woods transition from fixed to flexible management: Strong relations exist among the choice of exchange rate regime and countries growth. Policy implications are clear; the choice of exchange rate arrangement prevails no impact showing on the long-term countries growth, exchange rate anchor currencies of US Dollar, British Sterling Pound, Euro, Chinese Yuan, French franc, Deutschmark, and Basket currencies have a highly significant impact on countries growth of different income level. Suggest Chinese Yuan may consider alternate anchor currency for World and new measure of exchange rate controls developed. Central banks may be secure advanced country bonds, safe assets, and multi-currencies pegged systems adopted for the reserve to overcome the declining effectiveness of exchange controls.

Keywords: Foreign Exchange Arrangements, Macroeconomic Stability, Exchange Restrictions

Introduction

This study explores the global exchange rate system's arrangement in the last two decades. It shows the trend of peg world currency and its effect on countries growth and macroeconomic stability of the global economy. Robert Mundell and Marcus Fleming model of sixties; countries' central bank can practice an active monetary policy as a floating exchange rate regime that stabilizes the economy. Over the past decade, the choice of exchange rate regime and the macroeconomic has linked, received extensive attention and effects on trade flows (Eichengreen, Rose et al. 1996);(Rose 2000); (Rose); (Glick 2003); (Frankel and Rose 2002);(Rose and Stanley 2005); (De Vita and Kyaw 2011); (Abbott and De Vita 2008); (Adam and Cobham 2007); and literature identify empirical regularities between exchange rate arrangements, terms of trade shocks and price level of countries (Broda 2004); (Edwards and Yeyati 2005). This paper investigates the relationship between exchange rate regimes and the stable growth of the economy of 195 world countries. The U.S. dollar remains the most virtual currency when considering the integration of China, the Soviet bloc, into the international financial system and performs macro-economic stability in Latin America. A de facto exchange rate regime suggests that dollar cross-rate stabilization is as extensive after the postwar Bretton Woods fixed exchange rate system. Means new measure of exchange rate controls developed, central banks may be secure advanced country bonds as a reserve for overcoming the declining effectiveness of exchange controls(Farhi, Gourinchas et al. 2011);(Gourinchas and Obstfeld 2012);(Bruno and Shin 2017); (Farhi and Maggiori 2018).

A review of previous empirical work

An empirical study suggested; Firstly, the central bank can practice an active and quick monetary policy under a floating exchange rate regime depending on react and effects on the economy; second, stabilizing output as the fact of wages, prices in the content of Inflation. Third, central banks reduce uncertainty and destabilize exchange rate movements (Obstfeld, Rogoff et al. 1996).The study examined how the real exchange rate volatility affects long-run countries economic growth; Analysis used 82 emerging economies and advanced countries data from 1970 to 2009. Panel growth model and GMM model Results showed volatility effect on countries economic growth negative(Vieira, Holland et al. 2013).

Researchers argue that the share of the U.S. reduced in the global economy, and the U.S. dollar's role as the de facto global currency was also reduced (Eichengreen 2011). Researchers argue that the World was a multi-polar system where the Euro dominated Europe, the U.S. dollar in the Americas and the Chinese currency Renmimbi increased the influence of Asian currencies markets. The researcher estimated a large panel of exchange rate regime durability and performance of advanced, emerging and developing countries' economies from 1970 to 1999. They find developing countries more flexible regimes with high Inflation. Still, They do not directly gain the country's economic growth at the same time as fixed regimes deliver lower Inflation without surrendering growth (Husain, Mody et al. 2005). Exchange rate arrangement impacts macroeconomic stability(Ghosh, Gulde et al. 1997). Empirical Study panel of 60 developing countries for the period 1973to 1998 examine the impact of exchange rate regime on country growth by using GMM estimation and regime aggregation (flexible, fixes and middle). The exchange rate regime is classified into de jure and a de facto classification. The pegged regime was positively associated with growth; a middle regime was negatively linked with growth, others regime levels have no discernible impact on development (Bailliu, Lafrance et al., 2003).

The analysis comparing the economic development under alternative exchange rate regimes is interesting because we find answers to questions like:

1.How necessary are the exchange rate arrangements for global countries to anchor currency and economic stability? Is the development about under the top seven anchor currency regimes, or does it extensively deviate between different exchange rate regimes?

2.What is exchange rate controls developed and the central bank's possible to stabilize the global economies under an exchange rate (arrangements) regime? (3) Was the choice of exchange rate arrangement prevailing, and does the new option anchor currency and its impact on the long-term countries' economies; which exchange rate regimes optimal from a world economic stability point of view?

Data and Methodology

The main objective of this research is to investigate the exchange rate impact on world economies (income level). At the same time, our collection of countries on income level, i.e. high income, upper middle income, middle income and lower-middle-income (according World Bank data base), principally concerning exchange rate

arrangements (regimes), we get anchor currencies (US Dollar, British Sterling Pound, Euro, Chinese Yuan, French franc, Deutschmark, and Basket currencies), which Pegged 195 global countries' currencies (0 & 1) and his Pegged share of World in percentage i.e. 58 countries pegged with US Dollar and his World share 30.25%, 54 countries pegged with British Sterling Pound and his share World 27.18% and 22 countries pegged with French franc and his World share11.28% in 1961. Macro-economic variables GDP, Per Capita GDP, Inflation and trade data is collect according Income level countries rank i.e. GDP (high income), Per Capita GDP (high income), Inflation (high income), and trade (high income); GDP (upper middle income), Per Capita GDP (upper middle income), Inflation (upper middle income), and trade (upper middle income); GDP (middle income), Per Capita GDP (middle income), Inflation (middle income), and trade (middle income); GDP (lower-middle-income), Per Capita GDP (lower-middle-income), Inflation (lower-middle-income), and trade (lower-middle-income). We were able to use annual data for 195 global countries; data from 1961-2020.In addition to the exchange rate arrangements (regime) dummies, several factors identified in the growth literature are accounted for (Levine and Renelt 1992).

We adopt Generalized Method of Movements (GMM) to investigate the global impact of exchange rate regimes on the economy and macro-economic stability due to macro-economic variables, i.e., Per Capita GDP, GDP growth, Inflation, Foreign Trade. Due to estimate the symmetrical and asymmetrical relationship and impact between countries growth, and exchange rate regimes with panel data and endogeneity issue GMM is best option for analysis. The initial econometric model we used in our research regression is as follow:

$$Y_{i,t} = \beta x_{i,t} + \eta K_{i,t} + Y_t + Q_i + \varepsilon_{i,t}$$

Where the dependent variable $Y_{i,t}$ is showing the growth rate of real per capita GDP of the country I at time t, $X_{i,t}$ is a vector of explanatory variables, $K_{i,t}$, is a vector of exchange rate regime dummies, Y_t are time-specific effects, Q_i are country-specific effects, $\varepsilon_{i,t}$ are error terms and the ß's and ɳ's are parameters to be estimated. The estimators designed to incorporate individual and time products (Hall, Hondroyiannis et al. 2010)(Manuela Jr 2011, Le, Kim et al. 2016)to hold the systematic trend of $\varepsilon_{i,t}$ to be higher for some being countries than for others and higher for several periods than for other.

Results and discussion

Table 1. Descriptive Statistic Variable	Mean	Median	Maximum	Minimum	Std. Dev.

USD	47.07	46.92	57.95	29.23	9.56
GB	6.05	0.51	27.18	0.00	10.04
EUR	10.11	0.00	28.21	0.00	13.41
YUAN	0.37	0.51	0.51	0.00	0.23
FRF	6.42	9.74	11.28	0.00	4.95
DEM	5.15	2.56	15.90	0.00	5.28
BASKET	1.55	0.00	4.62	0.00	1.98
High-Income GDP	2.96	3.03	6.35	-4.64	2.04
High-Income GDP Per Capita	2.15	2.31	5.28	-4.97	1.91
High-Income Inflation	2.38	1.87	13.52	0.00	2.80
High Income Trade	40.03	41.45	63.25	0.00	19.36
Upper Middle Income GDP	4.96	5.00	9.64	-0.65	2.29
Upper Middle Income GDP Per Capita	3.58	3.52	8.91	-1.16	2.24
Upper Middle Income Inflation	4.02	2.60	22.57	0.00	4.94
Upper Middle Income Trade	33.99	32.78	62.42	12.20	16.36
Middle Income GDP	4.76	4.71	8.93	-1.45	2.02
Middle Income GDP Per Capita	3.01	2.84	7.66	-2.43	2.01
Middle-Income Inflation	5.07	4.65	13.77	0.00	4.37
Middle Income Trade	35.54	32.94	61.29	14.90	15.17
Lower Middle Income GDP	4.30	4.62	9.26	-3.87	2.25
Lower Middle Income GDP Per Capita	2.21	2.54	6.73	-5.18	2.28
Lower Middle Income Inflation	5.62	5.26	14.70	0.00	4.39
Lower Middle Income Trade	40.36	39.23	61.94	20.89	12.11

The table above shows the descriptive statistic results of 195 countries comparing income levels of High, Upper middle, Middle, Lower Middle of indicators of GDP, Per Capita GDP, Inflation, Trade and Currency Regimes. U.S. Dollar 47.07 mean showing major role player compared to other World currencies. Upper middle-income countries GDP are 4.96 and GDP Per Capita 3.58 high responding mean showing as compare to others high, middle and lower-income countries. As lower-middle-income countries most impacting variables mean of Inflation is 5.62 and Trade 40.36 comparatively others.

Table 2. U.S. Dollar Regime and Economy

Variable	High Income	Upper Middle Income	Middle Income	Lower Middle Income
USD	0.009908 0.542819	0.072089*** 6.206046	0.070933*** 7.26507	0.157892*** 6.724494
GDP PER CAPITA	1.202876*** 10.18396	1.268218*** 15.05036	1.303879*** 17.55859	1.154766*** 10.48226
INFLATION	0.024056 0.850667	0.097382** 2.64649	0.080425** 2.161129	-0.00709 -0.15787
TRADE	-0.0045 -0.3018	-0.0982*** -9.2791	-0.08448*** -8.64691	-0.14056*** -6.35301
R-squared	0.972939	0.940303	0.941912	0.93485
Adjusted R-squared	0.971463	0.937047	0.938743	0.931296
S.E. of regression	0.345771	0.556877	0.492552	0.594688

S.D. dependent var.	2.046849	2.219478	1.990101	2.268808
Sum squared resid	6.575683	17.05615	13.3434	19.45095
J-statistic	3.315577*	4.210312**	5.780851**	6.363311**
N(Observations)	260	260	260	260

The table above shows the U.S. Dollar regimes (Foreign Exchange Arrangements), Per Capita GDP, Inflation and Trade Impact on 195 Countries economies v-i-a high, upper-middle, middle and lower-middle-income level countries' sample period 1961 to 2020. The result shows GDP Per Capita is a highly significant variable in high-income countries compared to others for the period of 1961 to 2020. U.S. Dollar, GDP Per Capita and trade significant variable of upper-middle, middle and lower-middle-income group countries for countries economy during the sample period of 1961 to 2020. US Dollar Pegged countries, i.e. Foreign Exchange Arrangement is more important for upper-middle, middle and lower-middle-income group countries and because of significant share in world foreign Exchange anchor currencies.

Table 3. British Sterling Pound Regime and Economy

Variable	High Income	Upper Middle Income	Middle Income	Lower Middle Income
GBP	0.038461*** 11.21557	0.063834*** 3.888964	0.082166*** 5.89493	0.077197*** 7.976766
GDP PER CAPITA	1.031388*** 69.10724	1.3032*** 9.152375	1.109505*** 9.027201	1.070733*** 11.15074
INFLATION	0.057847*** 3.647196	0.120197*** 2.930595	0.177546*** 6.076091	0.172011*** 5.493628
TRADE	0.00884*** 7.887062	-0.02221 -1.39743	-0.00106 -0.10085	0.009556 1.119398
R-squared	0.994108	0.881914	0.929856	0.963215
Adjusted R-squared	0.993787	0.875473	0.926029	0.961209
S.E. of regression	0.161344	0.783217	0.541258	0.446854
S.D. dependent var.	2.046849	2.219478	1.990101	2.268808
Sum squared resid	1.431746	33.73861	16.11283	10.98233
J-statistic	5.056465**	4.954213**	5.768919**	5.507097**
N (Observations)	260	260	260	260

The table above shows the British Sterling Pound regimes (Foreign Exchange Arrangements), Per Capita GDP, Inflation and Trade Impact on 195 Countries economies v-i-a high, upper-middle, middle and lower-middle-income level countries for the period of 1961 to 2020. The results showing GBP, GDP Per Capita, Inflation and trade is highly significant for the high-income group. Compared to upper-middle, middle and lower-middle-income group countries showing GBP, GDP Per Capita, and Inflation most impacting and highly significant for economies during the sample period of 1961 to 2020. Bretton Woods's system regimes British Sterling Pound is the World's most prevailing foreign Exchange anchor currency, which impacts/influences the countries' economies.

Table 4. EURO Regime and Economy

Variable	High Income	Upper Middle Income	Middle Income	Lower Middle Income

EURO	0.005745 0.70528	-0.135383*** -4.60487	-0.154174*** -5.51371	-0.100367*** -9.16667
GDP PER CAPITA	1.275091*** 78.40312	1.021854*** 13.93096	1.173978*** 7.815015	1.098059*** 12.79377
INFLATION	0.04228 1.221626	-0.179375*** -2.8291	-0.189602* -1.87408	-0.052472 -1.01632
TRADE	0.001117 0.255597	0.098971*** 4.195637	0.10751*** 3.216311	0.080215*** 5.950328
R-squared	0.953919	0.873058	0.824378	0.93924
Adjusted R-squared	0.951405	0.866134	0.814798	0.935926
S.E. of regression	0.451213	0.812056	0.856441	0.574299
S.D. dependent var.	2.046849	2.219478	1.990101	2.268808
Sum squared resid	11.1976	36.26894	40.34204	18.14006
J-statistic	2.942433*	7.184672***	4.607818**	5.611812**
N (Observations)	260	260	260	260

The table above shows the Euro regimes (Foreign Exchange Arrangements), Per Capita GDP, Inflation and Trade Impact on 195 Countries economies v-i-a high, upper-middle, middle and lower-middle-income level countries groups for the period of 1961 to 2020. Primarily European countries currency is pegged with Euro and Euro exchange impacting the economies mainly in Europe. The above results also show the most significant impact of Euro currency and trade on upper-middle, middle and lower-middle-income groups' economies, even less impact leading in high-income countries. While Per Capita GDP is highly significant for all four income groups and Inflation is highly significant for an upper-middle-income group of countries' economies for the sample period of 1961 to 2020.

Table 5. Chinese YUAN Regime and Economy

Variable	High Income	Upper Middle Income	Middle Income	Lower Middle Income
YUAN	-1.045689** -1.9844	1.735894** 0.766351	0.139095** 0.043989	8.3586*** 4.7465
GDP PER CAPITA	1.25262*** 53.27082	1.783574*** 11.52938	1.760679*** 9.914859	1.095399*** 6.85628
INFLATION	0.061104** 2.223782	0.139042* 1.747057	0.226419** 2.101237	0.348008*** 4.632555
TRADE	0.011937** 2.559522	-0.081408** -2.12078	-0.050469 -1.3655	0.071588*** 4.507138
R-squared	0.961758	0.596407	0.61112	0.811777
Adjusted R-squared	0.959672	0.574393	0.589909	0.80151
S.E. of regression	0.411047	1.447956	1.274428	1.010803
S.D. dependent var.	2.046849	2.219478	1.990101	2.268808
Sum squared resid	9.292764	115.3117	89.32922	56.19476

J-statistic	1.966539	5.884385**	6.031046**	5.008741**
N (Observations)	260	260	260	260

The table above shows the Yuan regimes (Foreign Exchange Arrangements), Per Capita GDP, Inflation and Trade Impact on 195 Countries economies v-i-a high, upper-middle, middle and lower-middle-income level countries groups for the period of 1961 to 2020. Per Capita GDP is a highly significant variable for all four income groups' countries' economies. As Chinese Yuan pegged impact is highly at the lower-middle-income group of countries of the economy. Primarily, Chinese influence increased by Africa and Latin America where chine trade highly significant effect on economies of low-income groups countries, as well as Inflation also showing highly influential of those areas of the group of countries and 2nd high significant showing in high-income group countries of Inflation and trade Yuan impact on high-income economies for the data sample period of 1961 to 2020.

Table 6. French Franc Regime and Economy

Variable	High Income	Upper Middle Income	Middle Income	Lower Middle Income
FRF	0.000543	0.145684***	0.161254***	0.1500***
	0.01969	12.23006	13.69603	33.8326
GDP PER CAPITA	1.270509***	1.130854***	1.101108***	1.02603***
	17.0518	18.06904	16.56921	29.4355
INFLATION	0.025113	-0.03044	-0.0408	-0.0133
	0.556041	-1.20516	-1.2415	-0.6745
TRADE	0.003849	0.003915	0.018657**	0.02937***
	1.33774	0.509297	2.344606	7.71944
R-squared	0.955188	0.975072	0.976523	0.984142
Adjusted R-squared	0.952743	0.973712	0.975243	0.983277
S.E. of regression	0.444957	0.359856	0.313133	0.293394
S.D. dependent var.	2.046849	2.219478	1.990101	2.268808
Sum squared resid	10.88926	7.122294	5.392859	4.734401
J-statistic	2.662372	5.25222**	3.545166*	3.159029*
N (Observations)	260	260	260	260

The table above shows the Foreign Exchange Arrangements, Per Capita GDP, Inflation and Trade Impact on 195 Countries economies v-i-a high, upper-middle, middle and lower-middle-income level countries groups for 1961 to 2020. The results showing the impact of GDP Per Capita is highly significant for all four levels of the group's countries. The French Franc regime showed a highly significant effect on upper-middle, middle, and lower-middle-income countries' economies. Trade are an essential role player for countries economic growth, as French Franc regimes are more impacting and significance showing in the lower-income group of countries' economies for the data sample period of 1961 to 2020.

Table 7. Deutschmark Regime and Economy

Variable	High Income	Upper Middle Income	Middle Income	Lower Middle Income
DEM	-0.0209	0.1065	0.2239	0.2033***
	-1.4087	3.7432	4.0561	5.0955
GDP PER CAPITA	1.2899***	1.4504	1.3746	1.2789***
	80.9612	13.1914	11.1673	10.3766

	0.0554	-0.0138	-0.1260	-0.0893
INFLATION	1.6255	-0.2131	-1.1732	-1.2215
	0.0036*	-0.0241	0.0045	0.0218*
TRADE	1.6863	-1.5488	0.2428	1.7494
R-squared	0.949406	0.839361	0.8015	0.855596
Adjusted R-squared	0.946646	0.830599	0.79067	0.847719
S.E. of regression	0.472789	0.913502	0.91052	0.885361
S.D. dependent var.	2.046849	2.219478	1.9901	2.268808
Sum squared resid	12.29414	45.8967	45.5971	43.11249
J-statistic	2.632025	7.0529***	4.8142**	4.9698**
N (Observations)	260	260	260	260

The table above shows the Deutschmark Regime (Foreign Exchange Arrangements), Per Capita GDP, Inflation and Trade Impact on 195 Countries economies v-i-a high, upper-middle, middle and lower-middle-income level countries groups for the period of 1961 to 2020.DeutschmarkRegime is not influential regimes like Dollar and Euro because of less pegged and influence in exchange anchor currencies. Deutschmark Regime is significant for a lower-middle-income group of countries for his economies. As Deutschmark Regime (Foreign Exchange Arrangements) Per Capita GDP is highly substantial for a high and lower-income group of countries' economies, Inflation and trade are fewer performing variables During Deutschmark Foreign Exchange Arrangements as compared to other variables for the data sample for of 1961 to 2020.

Table 8. Basket Regime and Economy

Variable	High Income	Upper Middle Income	Middle Income	Lower Middle Income
BASKET	0.0732	-0.5864***	-0.7831***	-0.6276***
	1.1297	-4.9604	-5.1385	-8.2365
GDP PER CAPITA	1.2806***	1.3489***	1.2805***	1.0871***
	73.9576	13.0622	11.4568	14.1016
INFLATION	0.0566	-0.0669	-0.1168	-0.0499
	1.5075	-1.3125	-1.4174	-1.0670
TRADE	-0.0015	0.0406**	0.0795***	0.0788***
	-0.2855	2.0283	2.9364	6.3491
R-squared	0.952969	0.837032	0.809216	0.948288
Adjusted R-squared	0.950404	0.828143	0.79881	0.945467
S.E. of regression	0.455837	0.9201	0.892645	0.529818
S.D. dependent var.	2.046849	2.219478	1.990101	2.268808
Sum squared resid	11.42831	46.56209	43.8248	15.4389
J-statistic	2.389724	4.5482**	5.5078**	8.3501***
N (Observations)	260	260	260	260

The table above shows the Basket currency Regime (Foreign Exchange Arrangements), Per Capita GDP, Inflation and Trade Impact on 195 Countries economies v-i-a high, upper-middle, middle and lower-middle-income level countries groups for the period of 1961 to 2020. Per

Capita GDP is a highly significant result showing during Basket currency regimes (Foreign Exchange Arrangements) for all four levels of income group affecting the economies. Basket currency performs well and highly effective results for upper-middle, middle and lower-middle groups of economies but less impact on high-income groups of countries' economies. Trade is a highly significant effect on middle and lower-income groups and upper-middle group countries on 2nd place for trade significant for economies. Inflation is not a big problem for basket currency regimes countries groups during the data sample period of 1961 to 2020. Most countries follow additionally basket currency regimes instead of main pegged currency regimes for the stability of countries' economies and exchange rate stabilities.

Table 9. Economy and Currency

Variable	USD	GBP	EURO	YUAN	FRF	DEM	BASKET
High-Income GDP	-36.62	0.07	-10.55	0.05	-4.46	1.32	0.95
	-0.25	0.01	-0.57	0.13	-0.10	0.09	0.19
High-Income GDP P-Capita	29.43	-4.01	9.97	-0.03	2.83	-1.01	-1.06
	0.24	-0.08	0.56	-0.08	0.08	-0.08	-0.28
High Income Inflation	0.73	0.16	0.60	-0.01	0.43	-0.09	-0.02
	0.12	0.14	0.36	-0.07	0.56	-0.07	-0.10
High Income Trade	-0.70	-0.67	-0.24	0.01	-0.19	0.16	0.01
	-0.22	-0.49	-0.71	0.40	-0.20	0.63	0.05
Upper Middle Income GDP	-335.93	-212.66	-123.09	-3.49	-68.43	36.06	-32.99
	-0.37	-0.75	-1.12	-0.81	-0.35	0.46	-1.54
Upper M-Income GDP P-Capita	362.57	218.49	128.84	3.63	76.30	-35.27	33.57
	0.36	0.68	1.091	0.78	0.35	-0.42	1.41
Upper Middle Income Inflation	-1.37	-0.88	-1.75	0.02	-1.18	0.23	-0.03
	-0.11	-0.38	-0.49	0.16	-0.71	0.08	-0.09
Upper Middle Income Trade	65.99	51.13	20.18	-0.71	11.89	-10.66	-0.10
	0.26	0.42	0.78	-0.55	0.14	-0.56	-0.01
Middle Income GDP	822.58	493.07	270.58	7.29	173.28	-72.29	68.86
	0.36	0.65	1.11	0.75	0.34	-0.41	1.22
Middle Income GDP P-Capita	-894.07	-502.50	-285.57	-7.73	-198.1	67.44	-69.36
	-0.35	-0.58	-1.03	-0.71	-0.34	0.34	-1.10
Middle-Income Inflation	-0.99	-0.47	0.53	0.01	0.50	0.045	-0.04
	-0.17	-0.13	0.24	0.16	0.22	0.03	-0.17
Middle Income Trade	-271.89	-210.57	-81.62	2.88	-49.18	43.30	0.49
	-0.25	-0.41	-0.78	0.54	-0.13	0.56	0.01
Lower Middle Income GDP	-442.72	-259.65	-145.86	-3.78	-93.37	37.75	-36.25
	-0.35	-0.62	-1.09	-0.71	-0.33	0.39	-1.17
Lower M-Income GDP P-Capita	492.39	266.11	156.48	4.04	111.37	-34.51	36.24
	0.34	0.54	0.99	0.65	0.34	-0.29	1.01
Lower Middle Income Inflation	0.68	0.06	-0.66	-0.01	0.67	0.67	-0.08
	0.17	0.05	-0.83	-0.01	0.97	1.12	-0.68
Lower Middle Income Trade	205.32	158.86	61.89	-2.17	36.80	-32.81	-0.38
	0.25	0.41	0.78	-0.54	0.13	-0.56	-0.01

R-squared	-0.69	0.56	0.88	0.78	0.43	0.65	0.95
Adjusted R-squared	-1.28	0.41	0.83	0.71	0.24	0.53	0.93
S.E. of regression	14.16	7.49	5.52	0.12	4.33	3.65	0.52
S.D. dependent var.	9.38	9.73	13.46	0.23	4.95	5.32	1.99
Sum squared resid	8629.35	2412.25	1308.46	0.67	805.94	572.45	11.51
J-statistic	0.01	0.40	1.10	0.12	0.43	0.65	0.49
N (Observations)	260	260	260	260	260	260	260

The table above shows the Economy (GDP), Per Capita GDP, Inflation and Trade Impact on 195 Countries currency Regime (Foreign Exchange Arrangements) v-i-a high, upper-middle, middle and lower-middle-income level countries groups for the period of 1961 to 2020. The results show economies are not a big issue and do not have a high impact on exchange rate regimes. Per Capita GDP, Inflation and trade also do not have a big problem for exchange rate regimes arrangement for the data sample period of 1961 to 2021.

Conclusion

This study provides a comprehensive currencies history of 195 countries exchange rate arrangement and exchange rate regime impacts on countries growth macroeconomic stability of reference countries; New measurements of regimes foreign exchange arrangements over the time of 1961 to 2020. Under controlling the level of income of economies, we describe from alternative exchange rate regime organize schemes and monetary policy. These results, which prove robust to different estimation techniques and sensitivity checks, hold across exchange rate arrangements and apply irrespective of the level of economies of countries included in our sample.

By placing the issue of anchor currencies in useful quantitative historical data, this article offers new insight into current global finance issues of anchor currency; we find that post Bretton woods transition from fixed to flexible management: limited flexibilities in regimes. Strong relations exist among the choice of exchange rate regime and countries growth. The U.S. Dollar dominated in currency world with a very high margin. Most world countries desire to stabilize exchange rates reduce exchange restrictions, and influence dominant currencies. China is rapidly expanding its global role and connection through goods and services, growing international financial linkages. Chinese Yuan may consider alternate anchor currency. Chinese officials lend frontier, emerging, developing, middle and lower-income countries markets, not capturing governments through databases of the World Bank, IMF, or Bank of International system but entering with trade. The findings of policy implications are clear; the choice of exchange rate arrangement prevails, no impact showing on the long-term countries' economies. Suggest a new measure of exchange rate controls developed. Central banks may secure advanced country bonds, safe assets, and multi-currencies pegged systems adopted for the reserve to overcome the declining effectiveness of exchange controls.

Abbreviations
USD: US Dollar

GB: British Pound sterling
FRF: French franc

GDP: Gross Domestic Product
IMF: The International Monetary Fund

Euro: European Monetary Unit

YUAN: Chinese Currency

DEM: Deutschmark

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Monetary Policy Performance under Control of exchange rate and consumer price index

Muhammad Naveed Jamil[1*]

[1]Department of Management Sciences, (KFUEIT) Rahim Yar Khan, Pakistan

Corresponding Author: Muhammad Naveed Jamil, mnaveedknp@gmail.com

Abstract

Central Reserve announced the Monetary Policy Rate and equally interested in the output of exchange rate and price stability. Besides having a stabilizing effect on the price level and trend of exchange rate stabilized the countries outputs. This Study adopts Generalized Method of Movements (GMM) for panel data; to examine the monetary policies stability effect due to changes in Inflation, and Exchange rate. We use monthly data for seven World important countries which covering globally; United States, United Kingdom, Switzerland, Sweden, Denmark, Japan and India for the period of 1955 to 2021. We find that monetary policy control; the price level does not affect production and exchange rate. Monetary policy is the only thing that can change the trend of exchange rate and Consumer Price Index. The actual policy was fixed exchange rate, and currency devaluations like Japan were quite successful for stability. The results indicate that the central bank can stabilize much of the macroeconomic indicators and disturbances under a monetary exchange rate and consumer price index system.

Keywords: Central Bank Policy Rate; Monetary Stability; Consumer Price Index; Exchange Rate

Introduction

This journal aims to ask whether Central Bank Policy Rate is a cause of the low real interest rate on safe assets since the onset of the Covid 19 crisis. The Central Reserve usually it's a low-interest rate when it wants to stimulate the economy. But many researchers attribute the low real interest rate to fundamental factors. Such factors lead to associate with expected lower economic growth in future. Actual rates where common causes future growth is the expectation of being low. Caused by Fed policy was the low-interest rate in the United States and worldwide. This article exploits the research area of Central Bank Policy Rate Regimes to shed light on the most critical issue. From 1965 to 2021, the central Reserve operation Central Bank Policy Rate in a variety associated with four different Central Bank Policy Rate Regimes. These different Central Bank Policy Rate Regimes display further Inflation, interest rates, and Gross domestic product outcomes. (Bindseil 2016) and (Potter 2017). This research paper has used the difference in the results to understand better how Central

Bank Policy Rate affects those outcomes. Central Bank Policy Rate appears to affect the long-term real interest rate and gross domestic product during periods of Central Bank Policy Rate in Fed holds short-term high-

interest rates abnormally or abnormally low. This research article exploits the idea of Central Bank Policy Rate Regimes to explain whether Central Bank Policy Rate exact-rated the real interest rate the low on safe assets; the low consumption level during the period of the range the Fed's interest rate target set at 0 to 0.25 per cent. Observers have demanded the factors. The evidence describes suggestions that policymakers should consider. Low actual interest rates were the leading cause of fed. The idea of the Central Bank Policy Rate regime was central stand rd. The maximum standard contains the gold standard and early economies since 1880 and 1940; modified the Central standard with Bretton woods and dollar-gold arrangement. Bretton woods agreement failed and replaced the paper standard was in the early 1990s. This study examines the central bank's policies that countries follow and adapt to control paper money stand rd. There were two essential indicators for the economy; GDP and Inflation (Taylor 1993).

A Review of Previous Empirical Work

Different Central Bank Policy Rate Regimes lead to different equilibrium levels of real interest rates and GDP. Money assumed the Basic theories of classical dichotomy. Real factors determine real variables. Nominal variables determined by Central fiscal Policy. Even Keynesian models with sticky prices assume and the real effects were short-li Ed. For Central Bank Policy Rate to have persistent effects, consider extreme policies, or extend models to include more realistic features. Well studied example of extreme Central Bank Policy Rate is Inflation very high Inflation that causes firms to daily change prices and has little currency held by consumers. It reduces real interest rates and economic activity because the inflation Inter-fare with the price mechanism and equilibrium adjustments, efficiency in Market base economies. High Inflation was in the 1970s with extremely high central funds rates. The extreme policy led to high nominal and real interest rates. But policy continued because the high-volatile interest rates were disruptive to the economy. Gavin et al. (2015) applied a non-linear solution to a standard New Keynesian model to show a persistently low-interest rate can lead to output and persistently below the Model's been equilibrium steady. The equilibrium real interest rate was equal growth rare and the rate of time preference/equal; people were indifferent among current and future consumption. Factor keeps the interest rate low as the equilibrium level, then the amount the people want to borrow money will exceed the amount and people want to save. The interest rate cannot adjust, then income will fall until the number of people who wants to borrow equals the number of people who want to save (Gavin and Kydland 19 9). Central Bank Policy Rate can affect the real savings return; the low-interest-rate policy will persistently increase economic activity. Can be achieved economic activity optimal level, when the real interest rate returned to a normal level the association with the consumption growth rate plus preference the time rate. (Gavin, Keen et al. 2015) was never explicitly policy as the cause of low-interest rates. To model policy was a zero-interest rate environment, Central Bank Policy Rate models the price level is determined by central. The assumed financial policy was always to accommodate Central fiscal Policy. Assumption leads to examining interest rates wrong when they are stuck at zero and lower bonds. The central bank Policy rate was fixed and defaulted in financial policy. Models building central and financial policy of price level of theory were common (Sargent and Wallace 1981); (Nelson and Plosser 1982)' (Sims 1994); (Woodford 19 5). A recent paper developed this theory (Gavin 20 8). Research studies attempt to define why the extreme financial crisis followed interest rate zero policy. Rate preference of time was invariant over time and exogenous with Central fiscal Policy. (Bullard 2017) labor productivity growth rate was exogenous with Central bank fiscal policies. The rate preference of time was not observable; the rate preference of time rapidly fell with the financial crisis. While the labor productivity growth rates were independent of the Central bank policy rate, set of zero interest rate policy showed evidence of the high returns associated with high growth productively. Significance of irregularity after crisis period, low-interest-rate policy leads to low turnover and associate level of recession with low productivity growth (Caballero and Hammour 19 1). Real Economic activity relates to real interest rate theory influencing the consumption and saving decisions. High-interest rates produce high returns on investments and high returns on working. Opportunity building cost low capital expectations for future low-interest rates period (Williams 2017, Gavin 2018) The weight policymakers and price stability and the day-to-day implement policy since the mid-19 0s. The four important faces of Inflation and central bank policies: Great Inflation: January 1965 to October 1979, Volcker Reform: October 1979 to October 1982, Great Moderation: October 1982 to December 2008 and interest rate zero policy from December 2008 to December 2015 and central bank fund rates pegged as 0 to 0.25 per cent. After the Bretton Woods agreement, the great Inflation fails to establish the dollar to the gold standard. (Nelson 2005) was critics the people who policy making not understand the role of money, which leads to Inflation. (Gavin 2018) explain the framework of the Phillips curve was an unable and error-ridden measure of possible out. (Sargent 2002) describe the modern theory of advanced macroeconomics as ignored by the policymaker when the implemented Philips curve framework was, moderation theory reduces the inflation instability, and output fell 0.70 per cent and 0.89 per cent down during great inflation time per od. The Volcker period is 0.84 per cent, and Inflation does not go up with a low-interest rate in two time periods session. 1992 to 1994 and other was 2002 to 2 04. Fed was rapid economic growth since the 1990s, and high per capita consumption growth as Inflation is high as moderation regimes. FOMC used a risk management approach in the central bank's policy rate (Greenspan 20 4). The previous study indicates that under an exchange rate, the central banks can maintain the macro-economic situations during exchange rate no information lags and output stability. To say, under exchange rate simulate high-cost pay by the central banks in terms of instability of exchange rate and prices. Fixed exchange is the real policy, and devaluations were a proper tool from output stabilities (Edin and Vredin 1993).

Model and Data

The main objective of this study is to examine the impact of exchange rate and inflation on monetary policies. We use secondary research and data collect by World Bank, IMF and Central banks websites in term of month base. We adopt Generalized Method of Movements GMM) to examine the global impact of Monetary policies stability

$$M_t = \hat{\beta} q_{t-s} + \tau y_{t|t-s} - \gamma \sum_{\tau=0}^{\infty} (r_{t+\tau-s|t-s} - \bar{r}) + \hat{\eta}_t .$$ (1)

Here above equation, for any variable$x$, xt /t -s denote the standard expectation of the x t provision on complete information at times. Define rt is the short and as well as the long-run mean of interest rate. While the order of aggregate depends on the current sum and estimate future

$$q_t = e_t + p_t^* - p_t ,$$ (2)

Here, the exchange rate denoted e_t as price level P*t and domestic price level of CPI is indicate t. Monetary policy

$$r_t - r_t^* = q_{t+1|t} - q_t,$$ (3)

Where $r*$ t for short real interest rate and qt+1/t − q t is used to estimate relative changes in the real exchange rate.

$$\sum_{\tau=0}^{\infty} (r_{t+\tau|t} - \bar{r}) = \left(\sum_{\tau=0}^{\infty} \left(r_{t+\tau|t}^* + q_{t+\tau+1|t} - q_{t+\tau|t} - \bar{r} \right) \right)$$

$$= \sum_{\tau=0}^{\infty} (r_{t+\tau|t}^* - \bar{r}) - q_t .$$ (4)

While the only cause for the total current domestic and future estimate of actual interest rates to deviate from the current total and future estimate of real interest rates are

$$M_t = \beta (e_{t-s} + p_{t-s}^* - p_{t-s}) + \tau y_{t|t-s} + \eta_t$$ (5)

Here, q for the real exchange rate, government fiscal policy exogenous denoted variable η t which assumed

$$\eta_t = \rho_1 \eta_{t-1} + \rho_2 \eta_{t-2} + \vartheta_t$$ (6)

Here Ʊt. is for exogenous specifications; its same results produced when different variable exogenous openly introduced; ηt derived.

$$p_t = a_t + (1-a)(p_t^* + e_t),$$ (7)

Here *a denoted* the CPI price level elasticity. Suppose, no lag in pass through imports cost to the domestic price level

due to changes in Inflation, Exchange rate; panel data and endogeneity. We were able to use Central bank Policy rate, Inflation as CPI and Exchange rates of monthly base data for 7 World important countries which covering Globally; United States, United Kingdom, Switzerland, Sweden, Denmark, Japan and India for the period of 1955 to 2021. The initial econometric models we used in our research regression are as follow:

deviation of real interest rate, and it's means. There is a choice and planning chances of s period, exchange rate and Inflation affect the monetary policies with s lags period. The qt variables of real exchange rate such as defined

affecting the real exchange rate with an S period leg, market shares gradually adjusted relative change prices.

Qt the sum of current and future estimate deviate of real interest rate which is directly related.

accurate exchange rates, equilibriums levels vary. We get as:

independent monetary policy. η t is for autoregressive process

of goods imports. At the same time, there is the possibility to define the aggregate of supply equation as CPI of

$$\pi_t = \pi_{t|t-k} + by_{t+s|t-k} + \left(\frac{1-a}{a}\right)q_t + \hat{\varepsilon}_t,$$

(8)

Here inflation CPI describes as $\pi t = pt - p$ 1. CPI estimates Inflation future gap output as real exchange rate (t). According to equation (8), high Inflation raises the

$$\sum_{t=0}^{\infty} \delta^t E_{t-m}\left(\frac{1}{2}(m_t)^2 + \frac{\lambda}{2}(p_t - p_t^n)^2\right)$$

(9)

Here δ is denoted as a discount factor, and CPI price level determines Pn. Central banks minimize the loss function and period gave information as t-m, size of central banks

$$p_t = p_t^n + (1 - a)(p_t^* - p_{t|t-m}^*)$$

$$+ \left(\eta_{t+1|t-k} - \eta_{t+1|t-m}\right)\left(\frac{\delta a\beta(1-a)}{\delta(a\beta)^2 + \lambda(1-a)^2}\right) + \left(\eta_{t+s|t-k} - \eta_{t+s|t-s}\right)\left(\frac{\delta a\beta\tau(1-a)}{(1-\tau)(\lambda(1-a)^2 + (a\beta)^2)}\right)$$

$$- \eta_{t+s|t-k}\left(\frac{\delta a\beta(\tau b + (1-\tau)(1-a))}{\lambda(1-\tau)(1-a)((1-\tau)(1-a) + ab\beta)}\right)$$

(10)

$$+ \varepsilon_t\left(\frac{\delta(a\beta)^2(1-\tau)}{\lambda((1-a)(1-\tau) + ab\beta)(1-a)^2}\right)$$

$$e_t = p_t^n - p_{t|t-m}^* - E_{t-k}(\eta_{t+1})\left(\frac{\delta(a\beta)^2 b\tau + ab(1-a)(1-\tau)(\delta\beta + \lambda b)}{\lambda(1-a)(1-\tau)((1-a)(1-\tau) + ab\beta)}\right)$$

$$+ \left(\eta_{t+1|t-k} - \eta_{t+1|t-s}\right)\left(\frac{\delta a\beta}{(1-\tau)(\delta(a\beta)^2 + \lambda(1-a)^2)}\right)$$

$$+ \left(\eta_{t+1|t-k} - \eta_{t+1|t-m}\right)\left(\frac{\delta a\beta}{(\delta(a\beta)^2 + \lambda(1-a)^2)}\right)$$

(11)

$$+ \varepsilon_t\left(\frac{\delta(a\beta)^2 - \lambda(1-a)a(1-\tau)}{\lambda(1-a)((1-a)(1-\tau) + ab\beta)}\right)$$

Inflation.

aggregate demands as high Inflation is produced when the real interest rate declines.

indicated m information, e.g. CPI price level and financial position; we use following terms as estimation of inflation price level; nominal exchange rate and gap productivity.

$$M_t = \frac{a\beta(p_{t-s}^* - p_{t-s|t-m-s}^*)}{(1-\tau)} + (\eta_t - \eta_{t|t-m-s})$$

$$+ (\eta_{t|t-m-s} - \eta_{t|t-k-s})\left(\frac{\lambda (1-a)^2}{(\delta(a\beta)^2 + \lambda (1-a)^2)(1-\tau)}\right)$$

$$+ (\eta_{t|t-s-s} - \eta_{t|t-k-s})\left(\frac{\lambda (1-a)^2 \tau}{(\delta(a\beta)^2 + \lambda (1-a)^2)(1-\tau)^2}\right)$$

$$+ \eta_{t|t-k-s}\left(\frac{(1-\tau)(1-a) + ab\beta\tau}{(1-\tau)((1-\tau)(1-a) + ab\beta)}\right) \quad (12)$$

$$- \varepsilon_{t-s}\left(\frac{a\beta(1-\tau)}{((1-a)(1-\tau) + ab\beta)(1-\tau)}\right).$$

The stability of the monitory policy depends on the central bank's capacity. Central banks get the monetary action on the exchange rate to stabilize the price level; it depends on the value of λ.

$$\eta_t = M_t - \beta(e_{t-s} + p_{t-s}^* - p_{t-s}) - \tau y_{t|t-s}. \quad (13)$$

Thus, η is determined the productivity gap, the effect on fiscal policy stabilization, and the natural exchange rate variation. η Is *to* examine everything affecting the productivity gap, systematic fiscal policy and influences from monetary policy. I studied economic indicators over the period 1955–2021. They include the effective, Inflation, the consumer price index (*CPI*) and exchange rate. The policy goals more focus on inflation activities, therefore the addition of *CPI*. Policy tools as *C.F. C.F.* once hit the zero lower bounds and FOMC mentioned as policies at a balance sheet which a low rate on long term assists.

Results and Discussion

Table 1. Descriptive Statistic

Variable	Mean	Median	Maximum	Minimum	Std. Dev.
DENMARK CBPR	5.29	5.50	15.00	-0.75	3.44
INDIA CBPR	7.47	7.50	12.00	3.50	2.46
JAPAN CBPR	3.40	3.50	9.00	-0.10	3.01
SWEDEN_CBPR	5.19	5.00	40.00	-0.50	3.70
SWITZERLAND CBPR	2.29	2.00	7.00	-0.75	1.91
UK CBPR	6.33	5.91	17.00	0.10	4.14
US CBPR	4.69	4.25	22.00	0.13	3.71
DENMARK_CPI	56.53	61.33	113.35	6.99	36.79
INDIA CPI	47.62	23.95	185.43	2.31	50.83
JAPAN CPI	73.99	89.59	105.99	17.04	33.21
SWEDENCPI	57.24	58.20	114.54	7.47	37.93
SWITZERLAND CPI	66.90	69.56	101.05	22.50	28.70
UK CPI	56.07	55.46	127.02	6.29	39.11
US CPI	57.09	54.00	126.84	12.24	36.04
DENMARK DKK	6.70	6.75	11.94	4.72	1.08
INDIA INR	26.80	13.77	75.66	4.75	22.26
JAPAN JPY	206.04	143.70	362.62	76.37	107.09
SWDN SEK	6.50	6.38	10.86	3.90	1.62

SWITZERLAND CHF	2.27	1.64	4.35	0.80	1.31
UK GBP	0.55	0.57	0.92	0.36	0.14
US USD	1.00	1.00	1.00	1.00	0.00

The table above shows the descriptive statistic results of 7 world countries with the comparison of central bank policy rate; Central bank Policy Indian CBPR 7.47 on top as compared to others countries, as Japan CPI and JPY leading according to descriptive results 73.99 and 206.04 mean, which shows the effectiveness of Central bank Policy rate, Inflation and exchange.

Figure 1. Central Banks Policy Rate
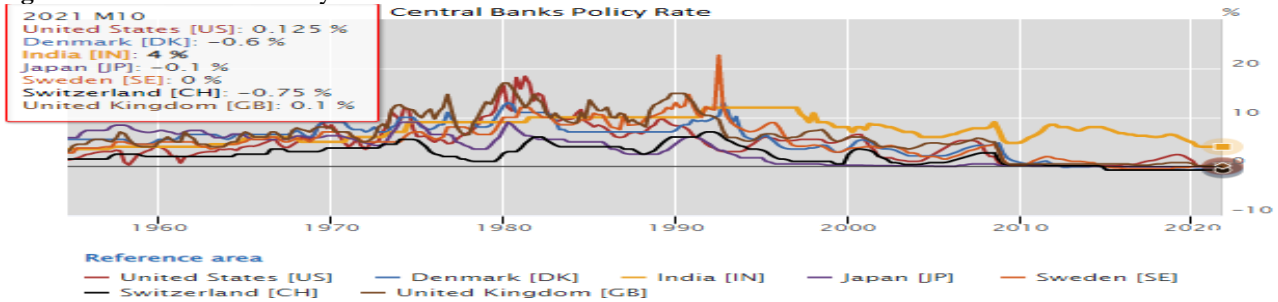
Figure 2. Inflation
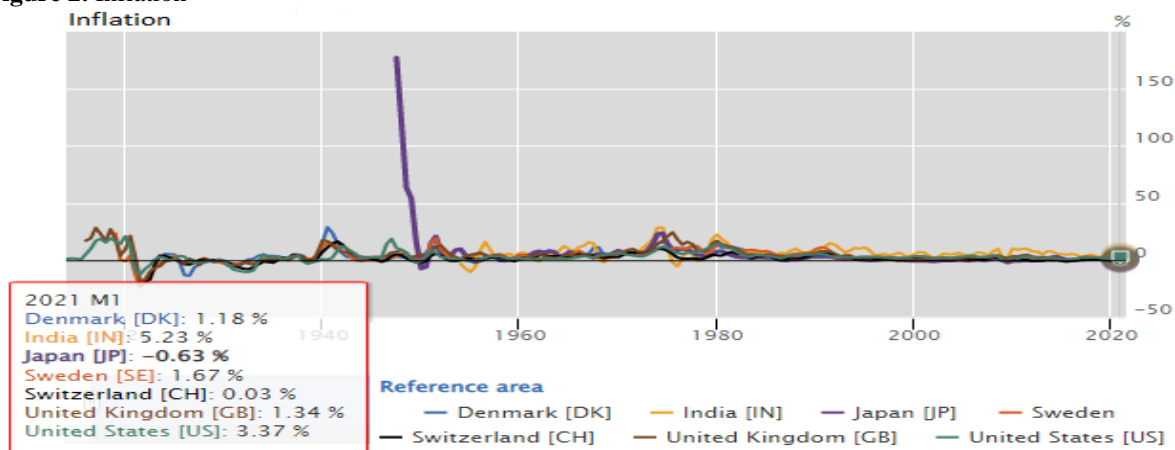
Table 2. Central bank Policy Rate and Regression

Variables	D.MARK CBPR	INDIA CBPR	JAPAN CBPR	SWEDEN CBPR	SWITZ. CBPR	U.K CBPR	U.S CBPR
INFLATION	-0.05***	-0.21***	-0.01***	1.37***	0.64***	-0.12***	-0.04***
	-9.47	-9.49	-6.95	18.26	11.99	-13.91	-6.16
EXCHANGE RATE	1.15***	0.58***	0.02***	-0.07***	0.01**	23.18***	7.18***
	22.31	11.51	33.74	-8.73	2.26	22.39	11.57
R-squared	0.37	-2.13	0.75	-0.09	0.02	0.36	0.18
Adjusted squared	0.37	-2.14	0.75	-0.10	0.02	0.36	0.18
Sum squared res	5960.35	15233.24	1802.12	12028.86	2885.80	8771.22	3.71

J-statistic	15.96***	62.76***	12.95***	21.75***	22.63***	2.53	9056.47***
Observations	802	802	802	802	802	802	802

The table above shows the Inflation and exchange rate how can effective the Central bank policy rate and monetary stabilities of 7 regional world countries date sample period of 1955 to 2 21. The above table shows the result of all seven regional world countries. The Inflation and exchange rate are highly significant and most effective for central bank policymaking and monetary stability. Compared with other countries, Japan Central bank policy is on top, most effective and highly significant for Inflation and exchange rate -0.01*** and 0.02*** respectively. This is leading the country monetary Policy stability, Inflation and exchange rate.

Table 3. Inflation and Regression

Variables	DEMARK CPI	INDIAN CI	JAPAN CPI	SWEDEN CPI	SW T.Z. CPI	U.K. CPI	U.S. CPI
C. Bank Pol Rate	-7.71***	-1.47***	-30.71***	-3.87***	15.25***	-4.42***	-4.11***
	-9.29	-11.31	-9.43	-6.60	10.61	-11.39	-5.69
Exchange Rate	13.96***	2.19***	0.76***	12.40***	-0.41	159.12***	76.38***
	19.99	38.81	12.44	35.13	-0.21	46.32	14.22
R-squared	0.23	0.94	-2.43	0.56	-3.08	0.74	0.18
Adjusted squared	0.23	0.94	-2.43	0.55	-3.09	0.74	0.18
Sum squa resid	836989.10	123143.90	3027034.00	512666.40	2692153.00	317400.10	853496.00
J-statistic	32.24***	1.77	66.79***	14.43***	56.88***	14.94***	2.10
Observations	802	802	802	802	802	802	802

The table above shows the Central bank Policy and exchange rate how can effective the Inflation of seven regional countries of world date sample period of 1955 to 2 21. The central bank policy rate has a highly significant negative impact on Inflation in 6 countries other than Swaziland's high positively significant effect on the P.I. The exchange rate shows the only more minor impact on Switzerland inflation but negative, other countries high impact positive effective showing exchange rate to Inflation.

Table 4. Exchange Rate and Regression

Variables	DENMARK DI	INDIAN IN	JAPAN JI	SWEDEN SEK	SW T.Z. CHF	U.K. GBP	U.S. USI
Central Bank Pol Rate	0.65***	0.88***	44.38***	0.44***	0.47***	0.03***	0.08***
	17.09	14.19	25.57	10.58	7.26	16.66	11.23
CPI(Inflation)	0.06***	0.42***	0.87***	0.07***	0.01***	0.01***	0.01***
	28.77	59.56	16.96	31.78	10.62	45.61	33.37
R-squared	-2.49	0.94	0.58	-0.59	-0.58	0.19	0.00
Adjusted R-square	-2.49	0.94	0.58	-0.60	-0.58	0.19	0.00
Sum squared resid	3248.979	23514.83	3891684.00	3346.55	2181.57	11.81	99.50
J-statistic	38.17***	0.22	39.61***	31.64***	42.73***	41.28***	39.48***
Observations	802	802	802	802	802	802	802

The table above shows the Central bank Policy and inflation impact on the exchange rate of 7 regional world countries from 1955 to 2 21. Central bank policy rate and Inflation (CPI) show a highly significant positive effect on exchange rates of above all seven countries for 1955 to 2021. This shows the importance of variables for exchange rates.

Conclusion

This study examines the potential of the central bank's monetary policies to stabilize the output. If we optimistically observe how monetary policy can conduct, policymakers want to find which fit Model for data placement. Econometric methods extract information's as a data structure (Gavin and Kydland 19 9). This research article has described the theory, analysis results, and empirical implications of alternative Central Bank Policy.

On the other way, Central Bank Policy Rate is measured with the exchange rate and Inflation. Extreme policy settings and the effect of the Inflation and exchange rate results may affect production and growth countries. During the seven years, 2007-08 financial and two years Covid 19 crisis, Result showing a low real interest rate effect on growth business trend.

I argue the possible effect of low-interest rates on real consumption and safe assets. The new policy regime and perhaps a return to the old one raises the central fund's rate target below normal to one and are closer to normal. The Real economy did not damage during slightly complex monetary policy control, higher interest rates and exchange rate devaluation the trend summers (Gavin 20 8). Using a floor system for central funds rate control

by large balance sheets may raise interest rates. Monetary control is low-level safe assets consistent with growth normal consumption. I expected the primary bank policy rate affecting the Inflation and deciding how to make a new policy regime during forecasts and planning future work important safe assume long-run central objective during the extreme policy positions. The past studied evidence survey by (Williams 2014) suggested that the

Central bank exchange rate policy can influence long-term real interest rates on safe assets. Sign of effect of low-interest policy rate on real economic activities. The real exchange rate had a long-lasting impact on output during the period, which shows the real policies were fixed exchange rates and currencies devaluations like Japan was quite successful for stability. Japan Monetary Policy is efficient and valuable in Inflation and exchange rate. The results indicate that the central bank can stabilize much of the macroeconomic indicators and disturbances under a monetary exchange rate or interest rate. Japan follows these terms and more effective control as compared to others.

Data availability: The data sets generated and analyzed during the current study are available from the corresponding authors on reasonable request.

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RESEARCH ARTICLE

The effect of Foreign direct investment and financial development on economic growth: Evidence from global income countries

Robeena Bibi[1], Sumaira[2*]

[1]School of Public Administration, Hohai University, Nanjing China.
[2]College of Economics and Management, Zhejiang Normal University, Zhejiang, China

Corresponding Author: Sumaira, sumairakhan321321@gmail.com

Abstract
Prior researches have explored the role of FDI and economic growth or financial development and economic growth in a particular sample of countries or region while no collective studies on the effect of FDI, banks and stock market on economic growth in region or income-based groups have been conducted yet. Using a balanced panel data set of the globe of 193 upper middle income (UMI), lower middle income (LMI) and high income (HMI) countries for the period of 1998 to 2018, the study ever the first time explore the role of FDI, banks and stock markets financial development on economic growth by employing static methods and Dynamic approaches which contributes to the scarce literature on the collective and across income-based groups of countries. All model findings for the global panel indicates that FDI affect economic growth significantly and positively in the global panel, lower middle income (LMI) and upper middle income (UMI) countries where it's not true for high income (HI) countries. Banking sector development also affect economic growth significantly but negatively in the global panel, high income and upper middle-income countries while not significant for the lower middle income (LMI) countries. Stock market development also affects economic growth significantly but negatively in the global panel. Furthermore, the result concludes that FDI have a larger effect on economic growth than does banks or stock market financial development. This study suggest high income countries regards improving FDI attraction, lower middle income (LMI) countries in regards improve banking sector and collectively suggest to improve major driver and functioning of banking sector and stock markets to spur economic growth. This study is beneficial for the government channels and financial sector of the study countries to make further decision.

Keywords: FDI, Financial development; Income groups; Global panel; Dynamic model

Introduction

There have been conducted numerous studies on the association of financial development and growth and some studies have been conducted on the association of FDI and economic growth. Some of the prior studies have only focused on FDI and growth while some studies have examined whether development of financial sector enhance growth level while they have ignored FDI. Some studies have used only bank-based proxies for financial development and have ignored stock market indicators. No studies have yet focused on the association of FDI, financial development by banks and stock markets and economic growth. This association among financial development, FDI and economic growth has made special attention. Both

financial development and foreign direct investment are important in augmenting economic growth as financial development of a country plays very essential protagonist in a country economic growth. Financial intermediaries are important in investments monitoring and succor in increasing productivity level.(Schumpeter, 1911) have esteemed the role performed by financial intermediaries in economic development.
Similarly, FDI is an important accelerator of economic growth as well it is apparent that both financial markets and FDI are the imperative determinants of growth and capital investment fund source which are essential for manufacturers, and the relationship regarding substitutable between them are very crucial. The current study entirely focusses on the relationship between FDI and financial

devolvement with economic growth in the global panel of 193 countries and further the global countries are categorized into lower middle income (LMI) countries, high income countries and upper middle-income countries. These countries have been categorized according to the World Bank classification of Atlas method for the current fiscal year 2020. Theoretically, the technological changes enhancement through the spillover knowledge effects , new capital goods, however the magnitude of FDI's role is the business environment in the recipient countries (Chamarbagwala, Ramaswamy, & Wunnava, 2000).

It is believed that the role of FDI in economic growth is higher in the recipient countries where have a developed financial system (M. Alfaro, Jarvis, & Gregory, 2004); (Durham, 2004). Additionally, FDI also plays important part in a country national economy modernization and augmenting economic growth. For this purpose, most of the countries have focused on the issue which are obstacle to FDI attractions because high level of FDI inflow enhance growth level of the economic.

Similarly, a well-developed financial system of an economy works to absorb capital inflows efficiently, effectively and specifically the flows are fungible. Therefore, financial development including banks and stock markets may explore the divergent outcomes in countries with different level of incomes. Moreover, the importance of financial sector as a precondition to growth effect of FDI can be the change in technologies (Hermes & Lensink, 2003). Financial markets and foreign direct investment are the two corresponding terms which strengthen the technological diffusion process and in turn its augment the level of economic growth.

The importance of foreign direct investment and financial development motivate this study. Therefor the current study investigates the FDI inflow role and the role financial development on economic growth in the global panel of 193 countries. Preceding studies have inspected the role of FDI and economic growth or financial development and economic growth in a small sample while no collective studies on the effect of FDI, banks and stock market on economic growth in region or income groups have been conducted yet. The current study has used the global panel data set of 193 countries which have been categorized into lower middle income (LMI), high income (HI) countries and (UMI) upper middle income for the period of 1998 to 2018. This study ever the first time explores the importance of FDI, banks and stock markets financial development in economic growth by employ the static methods OLS, random effect, fixed effect and Dynamic approaches difference GMM and system generalized method of moment's which contributes to the scarce literature on the collective and across income groups and regions effect of FDI, banks and stock markets development on economic growth. The study further give reasons of non-similar results in the different income based grouped countries which is a new addition to FDI, banks, stock markets and economic

growth collectively relationship literature and also beneficial for these countries policy making regarding their financial systems, international trade and policies regarding FDI attraction. The rest of the study is structure in the following steps; section 2 describes the previous literature of similar studies, section 3 is composed of methodology, 4th section illustrates the results while the last section is composed of conclusion.

Objectives of the paper

This study is conducted to investigate the important role played by foreign direct investment, banks and stock market financial development in economic growth in global panel and categorized income grouped countries; high income (HI), lower middle income (LMI) and high-income countries of the world panel for the period of 1998 to 2018. The aim of the study is to give policy suggestions for the improvement of FDI attraction in augmenting economic growth. It's further giving suggestions regarding banking sector and stock market development role in enhancing economic growth of these income-based countries.

Literature review

Predicated on the past studies, the current study present literature review in the following two sub sections. The first position gives definition of foreign direct investment; the second portion gives definition of financial development while section 3 gives a short definition of economic growth. Similarly, section 4 illustrates a brief description of the prevailing literature of FDI and economic growth, the section fifth is composed of financial development by banks and economic growth while the last section is composed of financial development by stock market and economic growth.

Foreign direct investment (FDI)

Foreign direct investment (FDI) can be defied that it's an investment which involves the relationship in long run and the resident entity control of an economy which can be foreign investors or the parent enterprises in an economy other than foreign direct investors or foreign affiliates or enterprises affiliates (OECD 1990; IMF 1993). Foreign direct investment suggests that the investors influence the management of an enterprise resident in other economies. This investment is most of by the equity capital which may involve long term involvement. It is also preferred over other capital flows such as the flow of private capitals including portfolio investments which are short term investment and flows more easily. According to (Farrell, Friesen, & Hersch, 2008) foreign direct investment composed of capital, entrepreneurship and management, capital and technology which permit firms to provide

services and goods for the operations in a foreign market. Such type of companies are refer to multinational or transnational corporations. Foreign direct investment is very important in a country economic growth. Export, higher production and other improvements in infrastructure implies that it can be a contributor to economic growth. For instance, the portfolio investment are the flows of capital into a country where they are seeking return in finance in medium and short term through stock and bond markets investment. Flow of Portfolio investment is not preferred by countries generally due to the reason it is associated with fast outflows in crisis period, and disables the local financial markets operations.

Financial development

Financial sector composed of financial instruments, a set of institutions and financial markets which are working to reduce information acquisition cost, transaction and contact enforcements. Those countries where have a well operative systems of finance enjoy higher economic growth. According to prevailing literature, FDI effect growth progress positively in an economy where this positive association rely on the absorptive capacities of an economy specifically the level of financial development. According to (L. Alfaro, Chanda, Kalemli-Ozcan, & Sayek, 2004), later after the financial crisis in 1980, the turmoil of emerging markets in 1990, the 2000 bubble burst and the recession of 2009, the developed countries attitude have changed towards outward flow of FDI. Moreover, (Shah, 2013b) statutes that FDI is one of the efforts in a country development as it motivated by higher efficiency and lower costs of the host country. According to this, most of the countries trying to establish agencies for investment and improving their financial and fiscal policies which can attract foreign direct investment and in turn enhance economic growth. They further argued that the low level of financial markets or lack of financial markets lowers the country to attract FDI inflow.

Economic growth

According to (Todaro & Stephen, 2011), economic growth as a steady process where the capacity of production increase overtime of an economy and the level of national income rising. The level of available resources causes the growth rate of an economy as well the quantity and quality of resources also matter the potential of a country grows. According to neoclassical theory, the economic growth can be increased when there is an increase in the factors of production and efficient allocation of researches. In economics, the growth of output potential in a country is referred to economic growth. The potential output may include full employment production which triggered by economic growth in the aggregate demand. This can be premeditated in terms such as the level of inflation in order to avoid negative inflation effect (Almfraji & Almsafir, 2014). The function of economic growth where it depend on GDP and directly on the net saving as well contrariwise on the capital output ratio (E. Domar, 1939; E. D. Domar, 1946). There are different factors which can enhance growth rate of a country such as foreign direct investment, well operative financial systems which includes banks and stock markets.

Foreign direct investment (FDI) and economic growth

The idea is grown out from the Keynesian Harrod-Domar growth model that FDI perform positive role of a country economic growth and then its extended to two gap models (Chenery & Strout, 1968). The growth theories of Harrod-Domar are related to saving function and induced investment in advanced economics. Where (Oladipo, 2010) investigated the different factors which effect FDI inflow in Nigeria. He found that human capital export orientation and market size is very important for foreign investors in Nigeria. Similarly, (Anyanwu, 2012) have studied FDI inflow in Africa and states that there are factors affecting the inflow of FDI is always lower in Africa. He further states that trade openness, foreign aid, market size, the exploration of natural resources and human capital affects the inflow of FDI positively. Moreover, (Sunde, 2017) have explored the FDI impact on economic growth for the south African country. His results indicate that export and FDI inflow positively affect economic growth. similarly, (Ridzuan, Ismail, & Che Hamat, 2017) studied FDI and growth in Singapore where he found that FDI enhance economic growth in Singapore. On the other hand, (Feeny, Iamsiraroj, & McGillivray, 2014), have found week association of economic growth and FDI while (Acaravci & Ozturk, 2012) studied FDI impact on growth and found mixed results.

Economic growth and Banking based financial development

Several studies on the relationship of economic growth and financial development have been conducted which indicates the positive association of finance and growth (A. J. Levine, 1997). If financial mediators including banks and other institutions of financing are driving a country's economy is referred to banking based system of financial development and the development of that system is called the bank based financial development (THL Beck, Demirgüç-Kunt, & Levine, 2001). The endogenous growth favors the crucial role performed by financial development in economic growth (Bencivenga & Smith, 1991). Endogenous literature indicates that a well-structured financial system mobilize savings in a proper way and efficiently allocate resources which in turn accelerate the flow of liquidity and reduce transaction costs (Bencivenga & Smith, 1991). The bank-

based financial system enhances the level of productive investment because it's less exaggerated by unsteady financial markets. Bank based system allow firms to remain with investment deprived of foremost them into insolvency so there for is good for economic growth (Demirguc-Kunt & Levine, 2001). By using private sector credit and domestic credit proxy of financial development (Adu, Marbuah, & Mensah, 2013) have found positive relationship of the two in Ghana while negative relationship when financial development proxies by broad money. Similarly, (Kargbo11 & Adamu, 2009) have also found positive association of financial development and economic growth in Sierra Leone by employing ARDL approach. Moreover, (Guryay, Safakli, & Tuzel, 2007) have examined finance and growth in Northern Cyprus. They have applied OLS approach and have found positive negligible relationship between financial development and economic growth.

Stock market development and economic growth

The stock and bond markets work as a motivator with banks and driving the economic activity through resource allocation and saving mobilization as well the managing of corporate side and risk management, that system of the economy is called a market-based financial system and financial market development is called the market-based financial development (Demirguc, Kunt and Levine, 2001). When the control of financial system is holding by stock market activities in the market based system and the monetary progress completely depends on the fluctuation of stock market accomplishments ((Jain, Trehan, & Trehan, 2013). If they system of an economy is market based, so the banks dependency are lower upon interest of gain or loans of their income over fee-based facilities as the checking financial records of accounts. In the market based financial system of a country, the wealth is not contributed equally. It's changing continuously and each single individual of an economy has the chance to lose or gain at any given time period (Trehan, 2013). Specifically, Schumpeter (1911) identified the prominence of financial sector contribution to economic progress by emphasizing that financial sector is an energizer of economy growth. (Sanusi, 2011) states that financial system performs a vital part in economic growth though the way of mobilizing an economy resource for investments and a channel for the amplification of regulatory policy. (R. Levine, 2004) argues that capital providers can control and effect the capital allocation of savings along with the national level decision effectively (Levine. 2004). Furthermore, (Morck & Nakamura, 1999) states that financial institutions of a country are debt providers are biased to farsightedness. Levine (2004) identified that the firms which have a main bank method and don't grow faster than those companies without a central bank. (R. Levine & Zervos, 1999) states that stock market

influence growth positively and robustly. Likewise, (Caporale, Howells, & Soliman, 2004) have identified the role of market development in economic growth. Their results evidence the strong and positive link between the two in the sample study countries. (Adjasi & Biekpe, 2006) indicates that there is positive link between stock market and economic growth. (Ujunwa & Salami, 2010) studied stock market advancement and its effect on economic growth in long run by using OLS estimation in Nigeria. In this study they have used, turnover ratio, value of stocks trades and market capitalization to proxy for financial development. Form the regression, they have got result which shows that the two variables that is stock market size and turnover ratios effect economic growth positively in Nigeria. On the other hand, (Bernard & Austin, 2011) have explored the relationship of stock market development with economic growth in Nigeria. They have found positive association between growth and development in presence of turnover ratio proxy of stock market development. Bernard and Austin (2011) have found positive association between market-based financial development and economic growth. Furthermore, (Morck & Nakamura, 1999) states that financial institutions of a country are debt providers are biased to farsightedness. Levine (2004), identify those markets gives some better tools to manage the risk and these tools allow high customization of risk-ameliorating appliances (Levine, 2004). Furthermore (Greenwood & Smith, 1997) states that Stock market minimize saving mobilization costs which works to improve the investment. (Diamond, 1984) states that markets give information about specialization and also acquisition which ease the level of further investments. The literature of endogenous growth supports the positive role of financial development in economic growth (Bencivenga & Smith, 1991). (Caporale, Gil-Alana, & Tripathy, 2019) and (AYAYDIN, KARAKAYA, & Fahrettin) have studied trade openness and financial development and its impact on growth and have fount positive and significant results. To know whether banks or financial markets have influence on growth and yet this debate is going on for a long time. While (Arestis, Demetriades, & Luintel, 2001; FUINHAS, FILIPE, BELUCIO, & MARQUES, 2019) have found that banks have a governing role in economic growth rather than stock markets.

Methodology

Variables and data

This paper employs annual dynamic panel data for the period 1998–2018 of 193 countries of the globe and world income countries. The data include GDP per capita which is our main independent variable, FDI inflow as a percent of GDP, financial development by bank (Constructed of three indicators broad money, private sector credit by banks, and domestic credit provided by financial sector as a percent of

GDP), financial development by stock market (constructed of three market indicators, stock turnover ratio, stock market capitalization, and stock value traded as a percent of GDP) and the control variables which included trade openness, saving, investment and inflation are obtained from world governance indicators (WDI) for the global panel of 193 countries. Beginning period based on the availability based on the availability of data. The descriptive statistic for different variables for the whole panel is given in table 1.

Empirical and Econometric Models

The current study investigates the effects of foreign direct investment and financial development on economic growth in the global income countries from 1998 to 2018. This study uses dynamic panel approach for the examination of the role of FDI and both banks and stock markets development in economic growth. The analysis has been done for categorized countries of upper middle-income economies, high income (HI) countries and (LMI) lower middle income. The current study apply the proposed GMM model of (Arellano & Bond, 1991) because the simple OLS or fixed effects models are not efficient and may lead to several econometric problems. Where the GMM in difference used the first differences of the dependent variables and the regressor which can transform the regression for the country specific effect abstracting and make the regressor time invariant. Here withal the first differenced lagged dependent variable is with instrumented

with precedent levels, therefor autocorrelation problem can be eliminated. However, in some cases the lagged levels of regressor poor instruments in the first difference regressor which lower the efficiency. For bringing better efficiency in assessment, Sys-GMM estimator's deals better for simultaneity biasness and country specific effects perception. For the better results with efficiency, this study could apply system GMM estimator of (Arellano & Bover, 1995) and (Blundell & Bond, 1998). In our study model we incline to transform the model into first difference for dispensing country categorical effect and employ the independent variables lagged levels as instruments for avoiding simultaneity biasness (Arellano & Bond, 1991).

However, there is arguing debates still continuing that this model may give doubtful results and conclusions when there the independent variables are conscientious in nature (Arellano & Bover, 1995). However, (Arellano & Bover, 1995) suggests system GMM estimator caliber as well as there are merged different equipollence. Sys-GMM suitable for this study because of two reasons. The first is; GMM utilized for controlling country categorical effects and endogeneity as well as omitted variables. Second, it is proposed for that situation where the duration is short in a study has quite a consequential number of individuals (Roodman, 2006) Consequently, we are utilizing two step GMM and system-GMM. The association between FDI, financial development by banks, stock market and economic growth are empirically observed by utilizing two equations in the following.

$$EC_{it} = a_1 EC_{i,t-1} + a_2 FDI_{it} + a_3 FDB_{it} + a_4 X_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots 1)$$

$$EC_{it} = a_1 EC_{i,t-1} + a_2 FDI_{it} + a_3 FDM_{it} + a_4 X_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots 2)$$

In the above given equations (1), (2), EC is economic growth proxied by per capita GDP, FDI, FDB, FDM represent direct foreign investment inflow, financial development by banks and financial development by stock market respectively. EC_(i,t-1) is the first lag of all variables of the left hand side given in equation (1) and (2) are utilized as an explanatory variable to quantify the effect of the anterior year's on the current year., INF is inflation, INV

is used to represent the level of investment which is calculated as fixed capital formation and TO is trade openness, . X it represents control variables that hypothetically affects our left-hand side variable. It includes, saving, trade openness, investment and inflation, whereas subscripts i (i = 1. . . N) And t (t = 1998 . . . . 2018) index country and time, respectively.

Table 1. Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max
GDPPC	0.993	0.999	-6.187	4.802
FDI	5.211	14.311	-58.322	451.716
Private sector credit	45.294	39.039	0.185	308.978
Broad Money	54.312	37.835	2.857	258.831
Credit by financial sector	58.302	52.552	-114.694	316.613
Stock turnover ratio	49.024	81.263	0.000	1721.54

Stock traded	30.160	47.615	0.000	372.26
Market capitalization	56.638	52.961	0.0534	352.445
Saving	21.715	11.830	-70.263	67.982
Inflation	6.691	19.188	-18.108	513.907
Investment	23.850	8.011	0.000	67.910
Trade Openness	88.083	49.265	0.167	437.327

In the prevailing literature two step and one step GMM have been recommended where the Two step GMM estimators is preferred by different researchers such as (Law & Azman-Saini, 2012). The reason of not preferring to consider one step GMM is the inefficiency which is showed theoretically as compared the two-step estimator GMM. Moreover, GMM of two step is beneficial estimator for analysis of such kind of studies as it employs optimum weighted matrices. Its further used the cross sections diminutive dimension which can lead to unequal estimator parameters (Law and Azman-Saini 2012; and (Windmeijer, 2006). Consequently, the current study used two step GMM system estimators for the purpose to examine the effects of FDI, financial development (both bank based and market based) on economic growth. The consistency or reliability of the GMM methods depends on two designation tests, serial correlation test (Arellano and Bond 1991) and a test of (Hansen, 1982) for over-identifying restrictions. In test of a serial correlation, the absence of the first order serial correlation (AR1) should be abnegated and accept the alternative hypothesis that shows the nonappearance of the second order serial correlation (AR2). On the other hand, for Sargan test the Null hypothesis should be accepted.

Results and Discussions

In order to evaluate the rationality of results and confirm that the best method is selected for the analysis, we associate different approaches Ordinary least square (OLS), fixed effect (FE) regression, random effect regression, Generalized method of moment of (Arellano & Bond 1991; Arellano and Bover 1995) and system-GMM model (Blundell & Bond 1998) for the global panel of 193 countries. Our main focus is on the generalized method of moments (GMM) and system-GMM approach because it gives us efficient and unbiased, while other methods are included for comparison purposes. We employed fixed and random effect to compare our results with the previous studies. We also admit that the results are potentially biased and unpredictable due to the dynamic panel bias and endogeneity problem that this method is incapable of

solving. Difference GMM is used for comparison and robustness purposes with system GMM and the results coefficient sign of difference GMM are corrects with system GMM results and confirm the results validity. The constancy or consistency of the GMM methods depends on two designation tests, serial correlation test of (Arellano and Bond 1991) and a Hansen (1982) J test of over-identifying restrictions. In a serial correlation test, the absence of the first order serial correlation (AR1) should be abnegated and accept the alternative hypothesis that shows the nonappearance of the second order serial correlation (AR2). On the other hand, for Sargan test the Null hypothesis should be accepted which designates that the instruments are valid and the model is correctly identified. In our analysis, the AR1, AR2 and Sargan test values are given which confirm the validity of our models. The results of pooled OLS, random effect, fixed effect, Dynamic GMM and Arellano–Bover/Blundell–Bond system GMM estimation are given in table below.

The effect of FDI and financial development by banks on economic growth of all models for the Global panel of 193 countries

In order to study the role of foreign direct investment and financial development by banks on economic growth for the global panel, we employ the static and dynamic approaches and the results are reported in table 2.
Table 2, column 1 shows the study variables, column 2 illustrates model 1 (OLS) results, column 3 and 4 illustrates random effect (RE) and fixed effect (FE) outcomes for different versions of the model while column 4 and 5 gives the GMM and system GMM results respectively. As discussed previously that OLS estimates might be biased and RE and FE provide comparatively unswerving parameter estimates, OLS estimates are given for comparison only. According to Huasman results the probability value (0.000) indicates that fixed effect is appropriate model. However, our findings focus on System generalized method of moments because it's the most efficient model as discussed in methodology portion above.

Table 2. The effect of FDI and financial development by banks on economic growth for Global Panel

Dependent Variable: E-growth	Model.1 OLS	Model.2 FE	Model.3 RE	Model.4 GMM	Model.5 Sys-GMM
FDI	0.103***	0.148***	0.133***	0.176***	0.133***
	(0.023)	(0.0300)	(0.027)	(0.011)	(0.009)
FDB	-0.171***	-0.571***	-0.341***	-0.566***	-0.235***
	(0.033)	(0.079)	(0.053)	(0.062)	(0.016)
Saving	0.233***	0.297***	0.254***	0.370***	0.275***
	(0.050)	(0.071)	(0.060)	(0.029)	(0.018)
Inflation	0.024	-0.111***	-0.065**	-0.192***	-0.042***
	(0.024)	(0.029)	(0.027)	(0.0095)	(0.005)
Investment	0.0208***	0.0201***	0.017***	0.0059***	0.016***
	(0.003)	(0.0052)	(0.004)	(0.002)	(0.0009)
To	0.0013**	0.0026	0.0012	0.009***	0.0007**
	(0.0005)	(0.0016)	(0.0009)	(0.001)	(0.0003)
L.gdppc				-0.004	0.206***
				(0.010)	(0.008)
Constant	0.115	1.447***	0.806***		0.298***
	(0.184)	(0.349)	(0.261)		(0.077)
Observations	1,642	1,642	1,642	1,058	1,371
R-squared	0.088	0.074			
Number of id		133	133	122	132
AR1				-4.78(0.000)	-4.89 (0.000)
AR2				-1.64(0.101)	0.13 (0.896)
Sargan test				119.57(1.000)	124.25(1.000)
Hausman test					

Note: Standard errors in parentheses. *** = Significant at 0.01, ** = significant at 0.05 and * = 0.10 percent levels respectively. FDI is foreign direct investment, FDB is bank based financial development, OLS is ordinary least square, GMM and SGMM are the generalized method of moments and system generalized method of moments respectively.

In table 2, the lagged dependent variable is highly statistically significant at 1 percent level, the results of all models OLS, FE, RE, GMM and system GMM for FDI are also highly statistically significant at 1 percent level and positive which indicates that foreign direct investment is very important and contribute to economic growth in the global panel of 193 countries. Its further indicates that an increase in foreign direct investment increase economic growth positively in the global panel. The finding of our study is reinforced by (Lee & Chang, 2009) and (Olofin, Aiyegbusi, & Adebayo, 2019) who have also found positive impact of FDI on economic growth in a sample of 37 countries. The positive impact of FDI in the panel may be due to the high facilitated FDI and international trade policies. The level of foreign direct investment can also be high if there are good quality institutions, good governance and political stability in the countries which protect foreign investors.

Similarly, financial development by banks is also highly statistically significant in all models at 1 percent level but negative which indicates that banking sector development

influence economic growth significantly but negatively in the global panel. These findings are similar to the findings of (Lasbrey et al., 2018) and (Lee & Chang, 2009) who have also found positive impact of FDI on economic growth. The negative effect of FDB may be due to lower income countries in the global panel because these countries may have low level of banks development. The results suggest that there is a passionate need of the development of financial sector to strengthen growth rate specifically in the lower income economies including in the panel. Establishments and promotion of microfinance institutions are the complements to commercial banks will play a precious part in saving mobilization and providing access for funds which can help upsurge economic growth.

Moreover, the control variables saving is also at a 1 percent which is very highly significant in the models and positive which designates that saving affect economic growth positively and significantly which signifies that an increase in saving level enhance economic growth positively in the global panel. Moreover, inflation is also highly statistically significant most of in all models but negative which indicates that inflation affect economic growth negatively in

the panel of 193 countries. Similar results to our findings are found by (Caporale et al., 2019) and also (Effiong, Odey, & Nwafor, 2019). These results statues that increase in the inflation level cause to affect decrease economic growth in the study sample. Inflation is negative consistently with is used for the macroeconomic stability proxy in all study models. The result which is negative is similar to the macroeconomic instability argument which is harmful to economic growth. the high rate of inflation rises the risk and uncertainty in a country which in turn reduce investment in the long run. Conversely it is stated that inflation is an important factor to explain economic growth.

Likewise, the investment is also significant highly and positive which shows that the rate of investment positively and significantly affects economic growth in the global panel. Investment is measured by the fixed capital formation which exerts positive affect and shows that investments which can be public or private are essential in productive sector for economic development in the economy. The findings are similar to the standard theory of growth which emphasizes that investment is important through capital accumulation which spurs economic growth. Similar result to our findings are found by (Nyasha, 2014), (Effiong et al., 2019) and (Bist, 2018).

Moreover, the coefficient of trade openness is also highly statistically significant and positive in OLS, GMM and system GMM which indicates that trade openness also contributes to economic growth positively. it has been also considered that the country openness is essential source for augmenting economic growth by different researchers such as author (Thorsten Beck & Levine, 2004), (BANDA, 2005), (R. Levine & Zervos, 1998). Similar result of trade openness is found by (Deyshappriya, 2016) and (Mamingi & Martin, 2018) which reinforced our study findings for trade openness. According to an author, Banda (2005) who states that the level of freed trade and liberalization of

economic augment the efficient allocation of an economy which in hence upsurge economic growth. The result further proves that the trade of sampled countries has been enhanced at high level and states about the financial system, governance, corruption. it can be positive and significant also due to high amount FDI inflow which can be the result of high economic growth.

The effect of FDI and stock market development on economic growth for all models in the global panel of 193 countries

In table 3, the lagged dependent variable is significant highly at 1 percent, the results of all models OLS, FE, RE, GMM and system GMM for FDI are also highly statistically significant at 1 percent level and positive which statutes that FDI is crucial for economic growth in the panel of 193 countries. Its further indicates that an increase in foreign direct investment increase economic growth positively in the global panel. The finding of our study is reinforced by Nlandu Mamingi and Kareem Martin (2018) who have also found positive significant impact of FDI on economic growth. The finding also indicates that FDI have been improved in the counties. Similarly, financial development by stock market is also highly statistically significant most of in all models at 1 percent level. For instance, model 1 (OLS) and model 5 (system GMM), the coefficient of financial development by stock market is highly statistically significant and negative which indicates that stock market financial development influence economic growth significantly but the relationship is negative. On the other side the result of FE and GMM are also highly statistically significant which indicates that financial development by markets influence economic growth positively in the panel of 193 countries. Which further indicates that an increase in

Table.3 FDI, stock market based financial development on economic growth in the global panel

Dependent Variable: E-growth	Model.1 OLS	Model.2 FE	Model.3 RE	Model.4 GMM	Model.5 Sys-GMM
FDI	0.0835***	0.161***	0.145***	0.141***	0.0518***
	(0.031)	(0.042)	(0.0371)	(0.021)	(0.016)
FDM	-0.093***	0.225***	0.014	0.298***	-0.156***
	(0.033)	(0.071)	(0.049)	(0.036)	(0.016)
Saving	0.211**	0.533***	0.275**	0.256**	0.143**
	(0.094)	(0.162)	(0.122)	(0.104)	(0.062)
Inflation	0.073**	-0.062	-0.012	-0.118***	0.009
	(0.036)	(0.043)	(0.040)	(0.011)	(0.008)
Investment	0.042***	0.013	0.0271***	0.0166**	0.034***
	(0.006)	(0.010)	(0.008)	(0.006)	(0.002)
Trade openness	0.0002	-0.001	-0.001	-0.0029***	0.0001
	(0.0006)	(0.002)	(0.001)	(0.0006)	(0.0004)
LGdppc				-0.0563***	0.327***
				(0.014)	(0.013)

Constant	-0.698**	-1.867***	-0.780**	-0.182
	(0.279)	(0.549)	(0.386)	(0.186)
Observations	867	867	867	560	730
R-squared	0.104	0.061			
Number of id			82	82	74	78
AR1				-3.42(0.012)	-3.71(0.101)
AR2				-2.01(0.045)	0.51(0.613)
Sargan test				571.12(0.020)	122.2(0.275)

stock market development contribute positively to economic growth.(Nyasha & Odhiambo, 2015) , (Alimi, 2015), (Sahoo, 2014), (Adu et al., 2013) have also found similar results to our findings. Furthermore, stock market development also assists in capital accumulation which can allow small investors which invest financial assets in the capital markets such as investment in bonds, stocks and debenture. According to the results of this study , well preforming and developed of stock markets are key indicators of macroeconomic development because it can motivate domestic and foreign investors for investment into the country which is an energizer for industrialization (Coskun, Seven, Ertugrul, & Ulussever, 2017), (Petros, 2012) (Pohoață, Socoliuc, & Bostan, 2013), (Cooray, 2010). Moreover, the control variables saving is also highly significant at 5 percent level in all models, while significant at 1 percent level in fixed effect model and the relationship is positive which indicates that saving affect economic growth positively and significantly which means that increase in saving rate enhance economic growth positively in the global panel. Likewise, inflation is statistically significant in OLS and GMM models where the relationship is positive in OLS while negative in GMM which implies that 1% increase in inflation cause to decrease economic growth -0.118 in the study sample. However, inflation has become an insignificant factor in explaining economic growth in other models which indicates that higher inflation rates as an indicator of macroeconomic condition lowers the economic performance of the countries. Deyshappriya (2016) has also got the negative impact which statutes that inflation effect economic growth considerably low and it may die at the time completely in long run. Inflation is one of the critical parameters concerning policy decisions of a country government. Changes in inflation influences economic policies to tighten that lead to increasing the nominal risk-free rate and affects the bank. The efficiency of the financial sector gets worse due to the high rate of inflation through financial market frictions and slows the economic performance down.

Likewise, the coefficient of investment is also highly statistically significant and positive mostly in all models which indicate that the rate of investment positively and significantly affects economic growth in the global panel.

Our results empirically proved that gross capital formation (investments) are positively correlated with economic growth which indicates that higher amounts of investments carried out by investors enhance the goods and services produced and thus lead to economic growth. this finding confirms that the investment is an important motivator which enhance economic growth where this result is similar with the findings of (Caporale, Rault, Sova, & Sova, 2009), (Ahmed et al., 2013). Rising investment levels have accounted for a significant part in the increase in growth rates achieved by those countries (Roemer, 2013). Moreover, the trade openness coefficient is statistically significant while negative in GMM model which indicates that trade openness affects economic growth negatively while the result for trade openness is insignificant in other models.

Income based grouped countries analyses

Meanwhile some sets of emerging countries are on diverse income brackets, I separated the sample into Upper-middle-income, High-income, lower-middle-income countries. FE, GMM and system GMM models for each income group re run separately with both bank based financial development and stock market based financial development and FDI role on economic growth.

The effect of FDI and banks development on economic growth in income based grouped countries (Upper middle income (UMI) countries, High income (HI) countries, lower middle income (LMI) countries)

Table 4 represents the results of FE, GMM and SGMM for all income based grouped countries. The lower middle income (LMI) countries results are given in group 1st where the result of FE, GMM and SGMM of FDI are highly statistically significant at 1 percent in FE and GMM while significant at 10 percent in the S-GMM which indicates that FDI affect economic growth significantly and positively in the (Lower middle income) LMI countries. The positive results indicates that FDI in the lower middle-income countries have been improved which can be the reason of improved governance, institutional quality, control of corruption and political stability in the LMI countries.

The result of financial development by banks for LMI countries in all models are insignificant which indicates that banks does not contribute to economic growth in the lower income countries. It can be concluded from the results that only FDI accelerate economic growth in the lower middle income (LMI) countries while banks don't play any role in the growth of lower income countries. The insignificant effect of banks on economic growth maybe the low level banking sector in the LMI countries.

Similarly, saving is significant and positive in FE and S-GMM models indicates that saving affect economic growth positively in the lower income countries. The investment is significant and negative only in GMM model while trade openness is negative and significant in GMM and SGMM indicates that investment and trade openness affect economic growth negatively while inflation is insignificant in all models for the lower middle income (LMI) countries. (Mamingi & Martin, 2018) have also found the negative impact of inflation on economic growth. Similarly, Ireland (1994) and Deyshappriya (2016) also got the same findings which confirm the inflation effect growth considerably low.

Table 4: FDI, Financial development by banks on economic growth in lower middle income (LMI) countries, Upper middle income (UMI) countries and High income (HI) countries

Dependent Var.	Lower middle-income countries			Upper Middle-income countries			High income Countries		
Growth	FE	GMM	SGMM	FE	GMM	SGMM	FE	GMM	SGMM
FDI	0.155**	0.170***	0.0601*	0.200***	0.358***	0.312***	0.0381	0.0865	0.0610
	(0.0603)	(0.0567)	(0.0323)	(0.055)	(0.0674)	(0.0954)	(0.068)	(0.0846)	(0.0586)
FDB	0.227	0.0922	0.0781	-0.0148***	-0.0170	-0.0143*	-1.526***	-1.823***	-0.434***
	(0.161)	(0.185)	(0.0941)	(0.00316)	(0.0102)	(0.00735)	(0.260)	(0.386)	(0.124)
Saving	0.424***	0.120	0.118***	0.0109	0.0385***	0.041***	1.072***	1.327***	0.268*
	(0.146)	(0.142)	(0.0419)	(0.00683)	(0.012)-	(0.0127)	(0.301)	(0.363)	(0.158)
Inflation	-0.0101	0.200	0.0747	-0.00150	0.00893**	-0.00503	-0.115*	-0.255***	-0.105
	(0.0675)	(0.127)	(0.0608)	(0.00235)	(0.00391)	(0.00432)	(0.0696)	(0.0811)	(0.0668)
Investment	-0.00540	-0.0198*	0.0107	0.0190**	-0.0307*	-0.0137	1.477***	1.535**	0.675**
	(0.00917)	(0.0103)	(0.00693)	(0.00814)	(0.0154)	(0.0250)	(0.435)	(0.774)	(0.292)
Trade openness	-0.000441	-0.00928**	-0.00311*	0.00132	0.00969	0.00568	1.414***	1.300**	0.0846
	(0.00301)	(0.00385)	(0.00154)	(0.00254)	(0.00576)	(0.00404)	(0.429)	(0.583)	(0.121)
L.gdppc		0.0237	0.308***		-0.00552	0.269***		0.00255	0.295***
		(0.0817)	(0.0482)	0.793***	(0.0679)	(0.0541)		(0.0731)	(0.0663)
Constant	-0.645		0.231	(0.295)		0.143	-7.027***		-0.966
	(0.783)		(0.421)	570		(0.577)	(2.550)		(1.035)
Observations	345	226	301	0.086	392	477	337	205	277
R-squared	0.087			43			0.209		
Number of id	31	27	31		41	42	29	26	29

In case of upper middle-income countries, the results shows that both FDI and financial development effect economic growth. For instance, the result of FDI is highly statistically significant and positive at 1 percent level in all models which indicates that FDI affect economic growth positively. When there is an increase in FDI inflow will increase economic growth positively at 0.31 percent. The positive impact of FDI on economic growth may be due to high level of FDI inflow in the upper middle-income countries which further indicate that the level of institutional quality, governance and political stability is good in these countries which can attract high level of FDI.

Likewise, the financial development index is statistically significant but negative in the FE and SGMM models which indicate that bank based financial development have negative impact on economic growth in the upper middle-income countries. Mamingi, N., & Martin, K. (2018) have also found negative impact of financial sector on economic growth. The negative impact may be due to the low-level banking sector in the countries which need to be improved to facilitate economic growth.

Moreover, the control variables such as saving and investment also affect economic growth positively. For instance, the coefficient of saving in GMM and system GMM is highly significant at 1 percent level and positive which indicates that saving affect growth positively. Similarly, investment is also significant and positive in the fixed effect model while negative in the GMM model which statues that investment effect growth positively in FE while negatively in GMM model. Furthermore, inflation affect economic growth negatively and significantly only in GMM model while trade openness is insignificant in all models which indicates that trade openness has no effect on economic growth of the upper middle-income countries.

In case of high-income countries, it's interesting to know that FDI does not contribute to economic growth while only banks development affects economic growth. For instant,

the table blew shows the result of high-income countries in the third group where the FDI is insignificant in all models. Mamingi, N., & Martin, K. (2018) have also found that FDI does not affect economic growth in the sample of 34 countries in their study. The insignificant result of FDI regarding economic growth is due to low level of FDI inflow in the countries. The low level of FDI attraction can be the reason of poor institutional quality, governance and political instability in the countries because these issues can't protect foreign investors in the countries.

On the other hand, financial development by banks is highly statistically significant at 1 percent level in all models but negative which indicates that financial development by banks affect economic growth negative significantly. This negative impact is due to the low-level banking sector in the countries because of poor banking performance, banks will not contribute to economic growth.

The coefficient of saving is also significant for all models for high income countries where the FE and GMM is significant at 1 percent level while SGMM is significant at 10 percent. Inflation is negative and significant in FE and GMM models indicates that inflation lowers economic growth in the high-income countries. Trade openness in the FE and GMM model is significant and positive which reveal

the trade openness is performing well in the high-income countries. The GMM result indicates that a 1 percent increase in the trade openness will increase the growth rate by 1.3 percent. In additions, the economy openness has been thought out that it's the source of growth such as the study of Banda (2005), Beck and Levine (2004) and Levine and Zervos (1998). In addition, (Helpman, Krugman, & Krugman, 1989) and (Krueger, 1997) emphasized the inadequacies of import rules and policies, and states that trade openness move resources from inefficient to efficient comparative advantage ones activities.

System GMM Results for Global Panel, high income (HI) countries, lower middle income (LMI) countries, upper middle income (UMI) countries

Table 5 report the system GMM results for high income countries, lower middle income (LMI) countries, upper middle-income countries and global panel 193 countries, with economic growth as the dependent variable. The lagged dependent variables for all categorized countries have significant effect on FDI inflow.

Table 5: System GMM Results for Global panel, high income, lower middle income (LMI) and upper middle-income countries of FDI, financial development by banks and economic growth

Dependent var. Economic Growth	(SGMM) Global Panel	(GMM) High Income Countries	(GMM) Lower Middle Income	(SGMM) Upper Middle Income
FDI	0.133***	0.0610	0.0601*	0.312***
	(0.009)	(0.058)	(0.032)	(0.095)
FDB	-0.235***	-0.434***	0.078	-0.014*
	(0.016)	(0.124)	(0.094)	(0.007)
Saving	0.275***	0.268*	0.118***	0.041***
	(0.018)	(0.158)	(0.041)	(0.012)
Inflation	-0.042***	-0.105	0.074	-0.005
	(0.005)	(0.066)	(0.060)	(0.004)
Investment	0.016***	0.675**	0.010	-0.013
	(0.0009)	(0.292)	(0.006)	(0.025)
Trade openness	0.0007**	0.084	-0.003*	0.0056
	(0.0003)	(0.121)	(0.001)	(0.004)
L.gdppc	0.206***	0.295***	0.308***	0.269***
	(0.008)	(0.066)	(0.048)	(0.054)
Constant	0.298***	-0.966	0.231	0.143
	(0.077)	(1.035)	(0.421)	(0.577)
Observations	1,371	277	301	477
R-squared				
Number of id	132	29	31	42

Note: Standard errors in parentheses. (***), (**) and (*) indicate statistical significant at the 1, 5 and 10 percent levels respectively. SGMM stand for Dynamic system generalized method of momentums.

The impact of FDI on growth in the global panel for system

GMM is highly statistically significant at 1 percent level indicates that FDI in the global panel is high and most of the countries in the global panel have improved FDI inflow while the impact of banking sector development on economic growth for the global panel is significant but negative which indicates that banks affect economic growth negatively in the global panel. The results regarding FDB in the global panel further indicates that there is need to enhance the level of banking sector to enhance economic growth as banks are very important in economic growth.

The impact of FDI in high income countries is insignificant which indicates that FDI in these countries doesn't contribute to economic growth while the banking sector effect economic growth for these countries. The reason can be that the countries have ignored to facilitate FDI attraction as well the negative significant impact of banks on economic growth shows the low level banking sector in the countries. The impact of FDI on economic growth in the lower middle income (LMI) is positive and significant while the impact of banking sector on economic growth is insignificant which indicates that these countries have good level of FDI attraction but have ignored the banking sector growth which does not contribute to economic growth.

In case of the upper middle income the impact of FDI on economic growth is significant which indicates that these income-based countries have also good level of FDI inflow while the results of banking sector effect economic growth significantly but the relationship is negative which indicates that these countries have low level banking sector which

need to be improved to achieve high level of economic growth.

Other control variables such as saving effect economic growth positively and significantly in all groups as well in the global panel which indicates that saving has very important role in economic growth. The coefficient of inflation is statistically significant but negative in the global panel which indicates that inflation lowers economic growth in the panel while the results for all other groups regarding inflation is insignificant. Trade openness in the global panel in significant and positive which indicates that trade openness is important in economic growth while negative and significant in the lower middle-income countries which means that the level of trade openness in these countries are poor. The impact of trade openness for other groups countries are insignificant which indicates that trade openness has no impact on economic growth.

Summary of system GMM for global panel, High income countries, lower middle-income countries, and upper middle-income countries

Table 6 present the short summary of system GMM of the global panel, High income countries, lower middle-income countries, and upper middle-income countries with regards to the impact of FDI, financial development by banks, financial development by stock markets and economic growth.

Tables 6: Summary of the System GMM Results for FDI, FDB and FDM on economic growth

Dependent variable: Economic growth	Global panel	High income Countries	Lower middle-income countries	Upper middle income countries
FDI	Sig(+)	InSig(+)	Sig(+)	Sig(+)
FDB	Sig(-)	Sig(-)	InSig(+)	Sig(-)
FDM	Sig(-)			
Saving	Sig(+)	Sig(+)	Sig(+)	Sig(+)
Inflation	Sig(-)	InSig(-)	InSig(+)	InSig(-)
Investment	Sig(+)	Sig(+)	InSig(+)	InSig(-)
Trade openness (MT)	Sig(+)	Insig(+)	Sig(-)	InSig(+)

Note: Sig (+) represent positive significant relationship, Sig (-) negative significant relationship while Insig (-,+) show no relationship with economic growth.

Conclusion and policy implication

Prior researches have explored FDI, FD and economic growth but very rare studies have explored the collective association between FDI, FDB, FDM and economic growth. Moreover, the previous findings are exclusive on the clear-cut association between FDI, financial development and

economic growth across income groups and regions. While some of the studies have only found FDI and economic growth or financial development and economic growth in a small sample or region. This is ever the first conducted on the global panel of 193 countries where it further categorized the panel into upper income (UI), lower middle income (LMI) and high income (HI) countries which contribute to the scarce literature on the collective and

across income groups and regions effect of FDI, FDB and stock markets and economic growth. Using a balanced panel data for 193 countries for the time period of 1998 to 2018, the study explore the role of FDI and financial development on economic growth by employ the static methods pooled OLS, fixed effect, and random effect approaches and Dynamic approaches difference generalized method of moments and system generalized method of moment's approaches where all models results for the global panel indicates that both FDI affect economic growth positively in the global panel, lower middle income and upper middle income countries where the result is insignificant for high income countries. on the other side, banking sector financial development affect economic growth negative and significantly in the global panel, high income and upper middle-income countries while not significant for the lower middle-income countries. Stock market development also affects economic growth significantly but negatively in the global panel. The governments of high-income countries suggest to facilitate and accelerate the rate of foreign direct investment through the sectors which are favor by foreign investors as foreign direct investment augment economic growth and increase the level of capital formation as well decrease the level of unemployment. This can be achieved by providing better institutional environment to foreign investors, to stable political instability and control corruption level as well to provide some incentives to foreign investors. Moreover, the government of the countries should provide sound macroeconomic environment, to create good infrastructure and reduce or remove trade barriers. Moreover, central banks of the countries should use the monetary policy which increase the level of market capitalization in the economy because it helps the volume of exports, FDI and in turn economic growth. Besides, high income (HI) countries, other grouped countries of this study are also suggested to further facilitate foreign direct investment to achieve higher economic growth.

The lower income countries of this study are suggested regarding banking sector development as the banking sector of these countries performance is low as compared to other income group countries. These countries may bring improvements in the banking sector. This can be done through the fortification of competition in banking in the economy. Our study is good for policy markets of the lower income (LMI) countries which aspire them to develop their financial system especially banking sector, opening their capital accounts which may provide effectiveness and augment financial development.

The global panel is suggested to improve stock markets to avoid negative impact on economic growth. This can be done through such as by the market capitalization, limitation in credit expansion and the limitation of financial public sector of private financial markets. the global panel suggest to enhance the stock market development and consider capital markets as a source of financing as well as to lower saving and investment barriers globally.

Our study is ever the first one analyzed FDI, financial development by banks, financial development by stock markets and economic growth in the income grouped countries. Future study should examine this relationship in other level or region such as developing and developed countries as well can include other measure of proxies. The future studies can also try to include economic freedom and institutional quality along these measures to deeply investigate this association.

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The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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RESEARCH ARTICLE

Banking sector development and Economic growth in South Asian Countries: Dynamic Panel Data Analysis

Sumaira[1,] Robeena Bibi[2*]

[1]College of Economics and Management, Zhejiang Normal University, Zhejiang, China
[2]School of Public Administration, Hohai University, Nanjing China.

Corresponding Author: Robeena Bibi, khanrobeena321321@gmail.com

Abstract
This study explores the contribution of banking sector development to economic growth for a sample of four south Asian countries namely, Sri Lanka, Bangladesh, Pakistan and India. The study employed Fixed Effect (FE), Difference GMM and System GMM models to the data set for the period of 1980 -2017. The findings of the study indicates that bank based financial development index constructed of private sector credit, board money(M2) and domestic credit provided by banks affect economic growth significantly and positively almost in all models. The result approves that bank based financial development contribute to economic growth and augment growth level in the sample countries. The findings conclude that bank based financial development is important in boosting economic growth and suggests sampled countries of this study government's channels and regulatory authority on further improvement on banking system in order to achieve higher economic growth.

Keywords: Banking sector development, economic growth; Difference GMM, System GMM, South Asian-4 countries

Introduction

Financial development of a country plays very essential protagonist in a country economic growth. Financial intermediaries are important in investments monitoring and succor in increasing productivity level. (Schumpeter, 1911) have esteemed the role performed by financial intermediaries in economic development because these intermediaries choose firms where they use society's savings and perform their role in augmenting growth through the issuance of high quality of services related to financing. On the other side, (Lucas Jr, 1988) states the importance of financial development and its association with economic growth is overstrained. In the developmental economics review of (Demirgüç-Kunt & Levine, 2004), (Berman, Neumann, & Stern, 1989) haven't even discussed in the financial system omitted topics list. Levine (2004), and also another researcher (Grossman & Miller, 1988) have designated that financial market development and its impact on economic growth is a protruding intent to be studied. Similarly, (Gurley & Shaw, 1955), (Goldsmith, 1969), (Bagehot, 1873), (Fishkin, Keniston, & McKinnon, 1973) and Schumpeter

(1911) have stated that finance growth nexus shouldn't be overemphasized without the substantially adopted economic growth (Cited by Levine, 2004). Some researcher's states assertion that finance influence economic growth only in developed countries and it's not true for low- income economies. Moreover, some other economists contend that financial development is only beneficial in the early stage of a country (McKinnon, 1973). Nevertheless (Stiglitz, 1985) claims that bank-based financial structure is better than market-based financial system and its contribute more to economic growth, while (A. J. Levine, 1997); (Boyd & Smith, 1998) have opposing arguments to this. The views of different economists about economic growth shows that the increase in per capita GDP and aggregate income lead to economic growth, while some of the economists and pioneer even haven't mentioned finance in the developmental economics essays ((Meier & Seers, 1984). As mentioned above that some researches claims that financial development is significant in the early stage of development, therefor the low income economies will gain with high income countries in rapport to economic growth (Fung, 2009). However, some researches show that financial development is beneficial in the later stages of development. In this way the developing countries in

which the financial structure is not developed will gain with high and middle income economies in rapport to growth (Evrensel, 2002). There do already exist several studies on finance growth nexus in south Asian-4 countries but in general or have used only single proxy or mixed variables with traditional methods. To the best of my knowledge and based on previous literature, this study is ever the first one measuring separately the specific role of bank based financial development on economic growth in Pakistan, Bangladesh, India and Sri Lanka by using latest panel data for the period of 1980-2017 and models such fixed effect model, dynamic panel estimators (Differences GMM and System GMM).This investigation is useful for the government's channels of these countries regulatory and supervisory determinations towards strengthening financial system to achieve better economic growth.

The rest of the study is organized as follows; section 2 describes the previous literature, section 3 is composed of methodology, section 4 illustrates the results while the last section is composed of conclusion.

Review of literature

Several studies on the relationship between financial development and economic growth have been conducted indicates the positive association of finance and growth (A. J. Levine, 1997). To know that whether if there is development in the banking sector have an influence on economic growth and yet this debate is going for a long time and not been determined. If financial mediators including banks and other institutions of financing are driving a country's economy is referred to bank based financial system and the development of that system is called the bank based financial development (THL Beck, Demirgüç-Kunt, & Levine, 2001). This system composes of widening and deepening of bank financing. The endogenous growth favors the crucial role played by financial development in economic growth (Bencivenga & Smith, 1991). Endogenous literature indicates that a well-structured financial system mobilize savings in a proper way and efficiently allocate resources which in turn accelerate the flow of liquidity and reduce transaction costs (Bencivenga and Smith, 1991). There is arguing debate and some economists claims that banking development is better and contribute more to growth rate because banks provide investors information and help eases risk for them. These economists further argues that bank banks manage the risk associated with liquidity and provide safety to investors and in that's why banks are better than stock markets. all these reasons allocate capital efficiently and its in turn accelerate growth rate (Bencivenga and Smith, 1991). In the repayment timing the banks are performing better role than stock markets, as (Kumar, Rajan, & Zingales, 1999) argues that banks can direct firms gives information's regarding firms

operations. During new firm's establishment, the firms get banks financing and provide information's. According to (Kumar et al., 1999), the banks can force the firms to pay back their debts while the stock markets can't force it for the same case when there is absence of sufficient legal system in a country. For this purpose, it is concluded that a bank base system is superior to market base system because its help ease investment activities and in turn boost economic growth better than stock markets. There's tranquil ongoing debate claims that bank based financial system is performing better than stock market development in accelerating growth rate. Specifically, it is believed that the banking sector contributes more to economic growth because it induces long term investment in the real sector. On the other hand there maybe sensitivity to stock market prices in the market-based system where involved the number of short term investments (Hoshi, Kashyap, & Scharfstein, 1990). The bank-based financial system enhances the level of productive investment because its less exaggerated by unsteady financial markets. Bank based system allow firms to remain with investment deprived of foremost them into insolvency so there for is good for economic growth (Demirguc-Kunt & Levine, 2001). By using private sector credit and domestic credit proxy of financial development (Adu, Marbuah, & Mensah, 2013) have found positive relationship of the two in Ghana while negative relationship when financial development proxies by broad money. Similarly, (Kargbo11 & Adamu, 2009) have also found positive association of financial development and economic growth in Sierra Leone by employing ARDL approach. Moreover, (Guryay, Safakli, & Tuzel, 2007) have examined finance and growth in Northern Cyprus. They have applied OLS approach and have found positive negligible relationship between financial development and economic growth. To further investigate this dilemma whether bank-based development contribute to growth process also in developing south Asian-4 countries, the current study use banking development indicators to estimate the banking development role in sample countries.

Methodology of the study

Data

This study explores the effect of banking sector development (BFD) on economic growth in south Asian-4 countries, Sri Lanka, Bangladesh, India and Pakistan. The current study uses a panel data set for the time period of 1980 to 2017 downloaded from the (WDI) World Development Indicators, published by (WB) World Bank. The proxy variables for banking sector financial development used are private credit, broad money (M2) to GDP Per capita and financial credit by banks (FEB) while economic growth is proxy by real GDP per capita. Other

control variables were added, namely: inflation, real interest rate, saving and trade openness. All variables were downloaded from the same source. The data descriptive statistics is presented in table 1 below.

Table 1. Descriptive statistics

Variables	Mean	Std.dev	Min	Max
GDPPC	6.846	0.579	5.861	8.255
FDB	31.551	12.769	7.284	60.984
TO	48.346	25.470	12.219	113.597
Inflation	8.121	4.440	0.155	24.891
RIR	5.580	3.975	-10.24	14.821
Saving	26.175	6.676	8.332	53.046

Estimation method and empirical Model of the study

This study employs dynamic panel to study the role of bank based financial development in economic growth in south Asian-4 countries. Following model illustrate the linkage of bank based financial development with economic growth.

$$GDPPC_{it} = \alpha_0 + a_1 BFD_{it} + a_2 TO_{it} + a_3 INF_{it} + a_4 RIR_{itt} + + a_5 SAV_{it} + \delta i + \epsilon_{it}$$

Where, GDPPC is gross domestic product per capita used as a proxy for economic growth, BFD is bank based financial development index constructed of three Bank-based variables namely, financial credit provided by banking sector (FEB), the ratio of broad money (M2) GDP Per capita and Private sector credit (FdPvt) used to proxy bank based financial development. Other control variables used are; trade openness (TO), Inflation (INF), real interest rate and saving (SV), δ is unobserved country specific effect, while εt is the error term. The dependent variable in the model is lagged gdppc and there are time invariant country specific fixed effects. Country fixed effects omission in the panel data will lead to inconsistent estimators in levels and will be biased (Hsiao,1986). The explanatory variables here can be endogenous, thus it need to be controlled for endogeneity issue of the explanatory variables. (Chen, 2006) and (R. Levine & Zervos, 1998) used the initial values of the explanatory variables to avoid the simultaneity problem such result loss in information and potential consistency loss interpreting the estimation inefficient (Thorsten Beck & Levine, 2004). For efficient consistent model construction, the initial values be replaced with instruments. For the said purpose the developed model of Arellano and Bond (1991) first-differenced GMM estimation method is used. Thus, following the methodology of (Arellano & Bond, 1991) the given model below has been specified for the current study. In equation (2), first-differencing eliminates the

intercept as well as the country-specific effects.

$$Y_{it} = Y_{i,t-1} = \beta(Y_{it-1)} - Y_{i,t-2}) + Y(X_{i,t} - X_{i,t-1}) + (\epsilon_{it} - \epsilon_{i,t-1})$$

Results and findings

In the table 2 given below, the role of bank based financial development in economic growth is investigated via dynamic panel data techniques. The results of the FE, difference GMM and system GMM dynamic panel estimations with regard to Bank-Based financial development FDB for four South Asians countries (Pakistan, India, Bangladesh and Sari Lanka) are given in Table below. The Bank-based financial development index (FDB) exerts positive and significant impact on economic growth which states that bank based financial development index are fit to explain financial development and its positive and significant contribution to economic growth.

In the table 2, the estimated coefficient of FE and system GMM of FDB is statistically positive and significant on economic growth. This result indicates that if there is 1% increase in financial development cause to increases the economic growth in sampled south Asian's countries. the same result were found by (Abubakar, Kassim, & Yusoff, 2015) for Economic Community of West African States .moreover (Ibrahim, 2013) have also found positive significant impact of banking sector development on economic growth in Saudi Arabia. We note that the coefficient of the bank based financial development distributed by the banks and other financial institutions to the private sector is significantly positive. This observation may be directly linked to the predominant public sector in South Asians countries in the allocation of credits. Consequently, to improve the process of credit allocation, South Asians four countries need to accelerate the privatization of national banks or the reinforcement of the regermination of credit and the promotion of competition in the banking sector.

The implication of the results is that there is ardent need to develop the financial sector in order to stimulate economic growth in the economies of four countries. Development of microfinance institutions as a complement to the conventional commercial banks will play a great role mobilizing savings and providing ease access to fund, thus engendering growth process in the Asians countries.

Similarly, the estimated coefficient of GMM and system GMM of trade openness of sampled south Asian's countries has a negative and insignificant impact on economic growth while the results of FE is negative but significant results. This proves that the trade of sampled four countries has been reduced at low level due to weak financial system and governance, corruption and low

number of attractions of FDI inflow as a results lower economic growth. Therefor its suggest that these four

countries should focus to stabilize their financial

Table 2: The effects of Bank-Based financial development on economic growth

Variables	(FE)	(DGMM)	(SGMM)
FDB	0.0220***	0.000518*	0.000390*
	(0.00274)	(0.000388)	(0.000201)
Trade Openness	-0.00354*	-0.000270	-0.0001
	(0.00188)	(0.000211)	(0.000158)
Inflation	-0.0208***	-0.00178**	-0.000681
	(0.00664)	(0.000764)	(0.000724)
Real Interest Rate	-0.0207***	-0.00195**	-0.000517
	(0.00735)	(0.000862)	(0.000790)
Saving	0.0126***	0.00114**	0.000814**
	(0.00400)	(0.000498)	(0.000356)
		0.993***	1.008***
Loggdppc$_{it-1}$		(0.0115)	(0.00453)
			-0.0416
Constant	6.055***		(0.0331)
	(0.130)		
Observations	106	100	104
R-squared	0.874		
Number of id	4	4	4
AR1		-3.12(0.002)	-2.99(0.003)
AR2		0.04(0.970)	0.05(0.958)
Sargan Test		135.10(0.084)	145.75(0.091)

Notes: LOGGDPPC is log GDP per capita, FDB is a proxy of bank based financial development. FE is fixed effect, DGMM is difference Generalized Method of Moments, SGMM is System Generalized Method of Moments. *, ** and *** indicates significance level at 10,5 and 1% respectively.

system and others factors such as good governance, corruption and political stability in order to promote trade opens which in turn stimulate economic growth. Moreover, we also suggest that these four countries should focus on industrial productions in presence of good governance which can help increase export as a results economic growth magnificent. Likewise, the estimated coefficient of inflations and real exchange rate are statistically significant and the relationship is negative in FE and system GMM model, while the result of system GMM is statistically insignificant. This result implies that 1% increase in the inflations and exchange rate cause to decrease economic growth in south Asians four countries (Pakistan, India, Bangladesh and Sri Lanka). Indeed, the fluctuation in interest rate between the interbank of four countries are increasing due to political instability and weak governance resulting increase in inflation which effects economic growth of the four countries. Conversely, inflation has become an important factor in explaining economic growth. Ireland (1994) and Deyshappriya (2016) also obtained the insignificant results, and stressed that the impact of inflation on economic growth is considerably low, and may die out entirely in the long run.

The results of all models (FE, GMM and system GMM) is significant and the relationship is positive which indicates if there is 1% increase in saving cause to increases the economic growth of sampled four Asians development countries.

We find that saving is one of the most important indicators of economics growth which boost economic growth. In addition, this also proves that the increased mobilization of savings and the best allocation of resources in the economy permit an extension of production possibilities and the adoption of more efficient techniques, which reinforce specialization, technological innovation and economic growth. The overall result shows that bank-based financial development is positive and statistically significant impact on economic growth in the sample countries. Moreover, an increase in the bank-based financial development levels leads to an increase in the economic growth of South Asian sampled countries of this study. These results are similar to those found by other researchers on the same subject (see, among others, Andersen and Tarp, 2003).

Conclusion

The current study investigates the impact of Bank based

financial development on economic growth in four countries namely India, Pakistan, Sari Lanka and Bangladesh). The study employee Fixed Effect (FE), Difference GMM and Sys-GMM models to a panel data set for the period of 1980 -2017. After Controlling for endogeneity issue and specific country's effects, the data are reliable with theories that accentuate a consequential positive role in the process of economic growth for banks based financial development. The paper assessed only bank based financial development index and finds its effect on economic growth. We have applied different estimation techniques and procedure along with different control variables which gives the positive significant impact of banking sector development on economic growth. For instance, the two-step estimator of system GMM results prove that the bank based financial development index constructed of three variables are significant and positive mostly in all models, which betokens that bank based financial development play consequential role in boosting economic growth in samples countries of South Asia. The results of this paper have paramount policy implicative insinuation that a well performed financial system and policy is paramount for enhancing the development of financial market are paramount for growth rate in developing countries concretely the sampled south Asian-4 countries of this study.

The study suggests the policymakers of sampled countries to further improve banking system in terms of regulation and supervision which may further upsurge the vigorous link of financial development on economic growth in the sample countries of this study.

Acknowledgement

Conflict of Interests

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The relationship between trade openness, financial development and economic growth: Evidence from Generalized method of moments

Robeena Bibi[1], Sumaira[2*]

[1]School of Public Administration, Hohai University, Nanjing China

[2]College of Economics and Management, Zhejiang Normal University, Zhejiang, China

Corresponding Author: Sumaira, sumairakhan321321@gmail.com

Abstract
This study examines the effect of trade openness and financial development on economic growth four South Asian countries for the period of 1980-2017 using static and dynamic models. The results indicates that stock market development positively effect economic growth. The results validate that all three proxies of stock market perform a significant and positive role in augmenting economic growth in the sample countries. Trade openness, inflation and real interest rate significantly reduce economic growth while saving rise economic growth. The findings of this study have important policy implication for the sample countries regarding rising stock market in order to strengthen economic growth.

Keywords: Trade Openness, Stocks Market development, Difference GMM, System GMM

Introduction

The previous literature on trade openness and financial development and its relationship with economic growth indicates that a developed and well-operative economy requires a sound financial system which have strong financial regulations and institutional framework which efficiently allocate savings into investments. Likewise, international trade openness is also been considered that its plays a very important role in rising economic growth. The composition of financial institutions, financial markets, pension funds, securities markets and other intermediaries as well the regulatory institutions that allows the flow of money to accelerate economic activities is termed as financial system. The improvement of financial services poised of the establishments and development of financial institutions, and markets that upkeep investment and growth process ((FitzGerald, 2006). Therefore, it is agreed that a well-established financial structure is a crucial driver of economic progression which should be integrated to developmental policies. A well-established financial structure which is composed of better financial markets help ease savings into investments. It's also strengthening financial activities which in-turn increase the supply of financial facilities and enhance the growth level. According to (Patrick, 1966) countries trying to achieve

self-sustained growth of their economies and for this purpose they are trying to develop their financial sector Patrick (1966). Although it's widely accepted that financial development and economic growth have a strong and positive link but still there is noproper way to find the nature of association between the two. Many of empirical finding about financial development and growth are failed to establish this association. Some studies indicate the unpredictable association and the nature of direction about the link of financial advancement and economic growth. Many researches have been done on the linkage of financial development and growth and have found different views and opinion of this topic. Further, (Demetriades & Hussein, 1996), (Zang & Kim, 2007), (Odhiambo, 2008), (Liang & Jian-Zhou, 2006) have identified that better financial services increase the real output of a country. Therefor it is suggested that the development of an economy needs better financial structure. The study of (Lucas Jr, 1988), Stern (1989 and Robinson (1952) supports the insignificant link or they statutes even no link of financial development and growth. The common effect of financial advancement on economic growth has been still continuing. In the existing empirical studies, some studies have used only bank based financial indicators and have ignored market-based indicators for financial development proxy (Anthony Enisan Akinlo & Egbetunde, 2010). Some other debates

about the issue is undergoing about financial intermediaries and stock market development role in economic growth. On the other side, the relative prominence and contribution of banks and stock markets in influencing economic growth positively. Based on this debate, most of all countries need to rise economic growth where financial institutions such as banks and stock markets are the driver of economic growth. Other economic factors such as trade openness also rise economic growth where financial institutions are connected with trade facilitations. Thus, a well-established financial institution can contribute both to economic activities such as trade openness which in turn rise economic growth. This study aims to investigate whether stock market growth in four south Asian countries have any role in rising economic growth. This will identify the strength or weakness of the sample countries financial institutions specifically the stock market. Likewise, the study focusses to identify the role of trade openness of these four developing countries economic growth. Previous studies have identified the role of financial development on economic growth using single or common proxies however this study use three indicators of stock market development and created an index to investigate its effect on economic growth. similarly, trade openness in such association has not been investigated along other variables used in our study. The study used fixed effect, difference GMM and system GMM models where the results confirm that stock market development significantly increase economic growth while trade openness, inflation and real interest rate significantly reduce it in the sample countries. However, saving is significant and positive which illustrate that a rise in saving in the four countries leads to higher economic growth.

The remaining parts of the paper is structured as follows; part 2 is composed of literature review, part 3 present the methods used in analysis, section 4 presents the results while the section 5 conclude the paper and provide policy recommendations for the sample countries.

Literature review

Large number of researches have been conducted for different sample of countries and regions using different econometric models on the effect of financial development on economic growth. Some studies used banking sector variables while some use stock markets indicators to find its role in rising economic growth. likewise, no comprehensive study on stock market development or bank based financial development has been conducted as the previous studies use only single or commonly used indicators. Therefore, its is important to use all indicators of financial development and find its role in economic growth however this study only focus on stock market development deeply in order to efficient estimate the role of stock market in economic growth. It is accepted widely that financial system performs a very prominent role in economic growth and development of country's economy since it's contributing to the decisions related to saving and investments and hence it enhances the growth level (Levine, 1997). A developed financial system contributes more to the efficient financial resource utilization and help monitor the production of borrowers. The stock and bond markets work as a motivator with banks and driving the economic activity through resource allocation and saving mobilization as well the managing of corporate side and risk management, that system of the economy is called a market-based financial system and financial market development is called the market-based financial development (Demirgüç-Kunt & Levine, 2004).When the control of financial system is holding by stock market activities in the market-based system and the monetary progress completely depends on the fluctuation of stock market accomplishments (Trehan, 2013). If they system of an economy is market based, so the banks dependency are lower upon interest of gain or loans of their income over fee-based facilities as the checking financial records of accounts. In the market based financial system of a country, the wealth is not contributed equally. It's changing continuously and each single individual of an economy has the chance to lose or gain at any given time period (Trehan, 2013). Specifically, Schumpeter (1911) identified the prominence of financial sector contribution to economic progress by emphasizing that financial sector is an energizer of economy growth. He examines that the role played by financial sector is due because it allocates saving and improve the level of production. It's also bringing changes in technology and in turn economic growth (Schumpeter, 1911). Sanusi (2011) examined the performance played of financial system in an economy. He states that financial system performs a vital part in economic growth though the way of mobilizing an economy resource for investments and a channel for the amplification of regulatory policy. The previous literature acknowledged the importance of banks and stock markets which play a crucial role in economic development. Financial system also contributes its importance to the process of production and capital allocation which enhance the level of economic growth of a country. Financial system helps to get information about credible investments (Levine, 1997; 2004). Tripathy (2019) and (AYAYDIN, KARAKAYA, & Fahrettin) have studied financial development, trade openness and economic growth and have found that financial development effect economic growth positively and significantly while (Arestis, Demetriades, & Luintel, 2001; FUINHAS, FILIPE, BELUCIO, & MARQUES, 2019) have found that banks have a governing contribution to economic growth rather than stock markets. (Kpodar, Le Goff, & Singh, 2019) states that banking sector development acts as a shock-absorber in poor countries and developing countries. The information of production and collection cost are lowered

to a minimum level and the resource allocation are revised (Boyd and Prescott, 1986). Inefficient information about production goes to the optimum capital resource utilization. Financial system persuades information about financial services at a lower cost which help to improve the capital flow to the highest value. In other words, the financial system beneficial for investment opportunities assessments with a positive implication of resources allocation by economizing procurement costs information (Levine. 2004). Besides the performing role in the provision of production information and capital allocation, financial system also helps monitoring firms and keep an eye on corporate governance (Levine, 1997; 2004). A well systemic financial market used as the optimum allocation of capital resources and development economic growth. Levine (2004) argues that capital providers can control and effect the capital allocation of savings along with the national level decision effectively (Levine. 2004). In the case of the stock markets when the providing information about firms and it's difficult to discuss information which creates discouragement in this information where investors lose hope about this information. The banks are better in this case because banks have access to firms' information (Boot et al.1993). In the stock market there some individual performs for the easiness of trade assets or just for fun rather than as a crucial contributor of economic growth. There already exist some views which statutes that the stock markets which is efficient, contribute positively to economic growth because the stock markets provide trade assets very easily and fast. This quick response to investors. This permit investors to be less hesitant for giving up their investment markets and ensure the firms for constant capital access (Levine & Zervos, 1996). There is truncation associated costs with pulling funds from investors, this can be overcome stock markets service providers since its minimize the saving mobilization costs which work to improve the investment in creative technologies (Greenwood & Smith, 1997). Furthermore, Diamond (1984) states that markets give information about specialization and also acquisition which ease the level of further investments. (Obstfeld,1994) further, indicates that stock markets play a pivotal role in augmenting growth since these markets help ease the risk associated with investment and it strengthen the efficient allocation of resources and enhance growth. When there is competition, the stock prices provide information about firms to investors which is helpful for financial and in turn for economic growth while bank can't perform this (Allen and Gale, 1999). Levine (2004) statutes that those intermediaries which are powerful and have an enormous influence on firms may be in the bank-based financial structure and the influence related to this case maybe negative. For instance, Levine states that when the banks get information about different firms so they can abstract rentals from these firms and these firms pay for entree to capital. Furthermore, (Morck, Nakamura, & Shivdasani,

2000) states that financial institutions of a country are debt providers are biased to farsightedness. As the bank based financial systems may limit the corporate invention and economic growth. Those companies which have a close connection with a main bank will have a strong approach to capital than of those firms deprived of a central bank. Levine (2004) identified that the firms which have a main bank method and don't grow faster than those companies without a central bank. Furthermore, they state that the use of additional capital-intensive procedures than the non-central bank firms which take other things constant; they produce less profits. The next advantage, as Levine (2004), identify those markets gives some better tools to manage the risk and these tools allow high customization of risk-ameliorating appliances (Levine, 2004). Some supporter's claim that a well-functioning bank based financial system discover information easily in the public markets. Therefor it is reducing investor's incentives to get information (Stiglitz, 1985). The growing market development may reduce incentives for classifying pioneering projects that nurture growth. As Levine and Zervos (1996) have used market capitalization, total value traded and turnover ratio to proxy for stock market development in a sample of 41 countries. The regression results states that stock market influence growth positively and robustly. Likewise, Caporale *et al*. (2003) have identified the role of market development in economic growth. They have sampled found developing countries and have used market capitalization and total value traded as a proxy for stock market. Their results evidence the strong and positive link between the two in the sample study countries. In 2005, Bekaert *et al*. (2005) examined financial liberalization role in economic growth in large sample countries. They used turnover ratio for financial liberalization proxy and found positive relationship. Their results conclude that the market liberalization leads to 1 percent increase in real economic growth per year when it takes on average. These results give the largest response for growth in these countries with high quality institutions. (Adjasi & Biekpe, 2006) have examined stock market advancement and its association with economic growth. Sample countries of their study were 14 counties of Africa. They dynamic panel model was applied to the data. Their result indicates positive association between stock market development and economic growth. Furthermore, the results statutes the positive association of stock market growth and economic development is significant in upper-middle income countries. Nurudeen (2009) studied to analyze that is the stock market development effect economic growth. His study country was Nigeria and was applied error correction methods. His results show the market capitalization enhance economic growth in Nigeria. Likewise, Akinlo and Akinlo (2009) also explore the association of stock market development and growth in a sample of seven sub-Saharan Africa economies. They indicate the positive affect of stock market on growth in long-run. Ujunwa and

Salami (2010) studied stock market advancement and its impact on economic growth in long run by using OLS estimation in Nigeria. In this study they have used, turnover ratio, value of stocks trades and market capitalization to proxy for financial development. Form the regression, they have got result which shows that the two variables that is stock market size and turnover ratios effect economic growth positively in Nigeria. On the other hand, Bernard and Austin (2011), have used to examined the relationship of stock market development with economic growth in Nigeria. They have applied time series data with ordinary least square for the period of 19994 to 2008. To proxy for market size, they have taken market capitalization ratio while to proxy for market liquidity they used market size. They have found positive association between growth and development in presence of turnover ratio proxy of stock market development. The literature is rich of evidences which show the positive association of market-based finance and economic growth. Some of the empirical studies that presented by Ujunwa and Salami (2010) and Bernard and Austin (2011). These authors have studied the role of stock market development on economic growth have got the positive link in presence of stock market size and turnover ratio in the study country Nigeria. They further identified then when the stock market liquidity proxy by stock market liquidity, the relationship of stock market with economic growth was negative. Similarly, Bernard and Austin (2011), found negative result which shows the negative relation between stock market and growth. They have used stock market capitalization and total value trades for proxy in Nigeria. Following are some studies which summarize the nature of association of market-based finance and growth. Levine and Zervos, 1996 have examined the long run relationship between economic growth and Stock market growth in 41 countries. They have employed different variables Market capitalization, Total value of trades and Turnover ratio. They used Cross-country regressions and have found positive association. On the other hand, Caporale *et al.,* 2003 have studied Endogenous growth models and stock market development in a sample of four developing countries. Their study variables are GDP in levels, Market capitalization ratio, Value traded ratio, Level of investment and Investment productivity. They have followed Quarterly time-series method and non-causality tri-variate test and have found positive association. Bekaert *et al.* 2005 have studied the weather financial development enhance the level of growth? they have selected a sample of large number of countries. The variables they have used are real per capita GDP, Turnover and 25 other variables. They have also found positive association. Adjasi and Biekpe, 2006 have examined the link between Stock market development and economic Growth in African countries. GDP, Market capitalization to GDP, Total value of shares traded to GDP, Turnover ratio, Investment and Trade variables are used. They have used Dynamic panel

modeling to investigate the relationship. They have found positive association. Nurudeen, 2009 examines the role of stock market in raising economic growth in Nigeria. The Real GDP, Market capitalization, the ratio of market turnover, minimum discount rate and Openness variables are executed in the study. Time-series and Error-correction approach were used for analysis. Their study has found positive association between growth and stock market development. Similarly, (Anthony E Akinlo, 2009) investigated the Stock market development and economic growth for a sample of sub-Sahara African countries. They have used different variables such as; Per capita nominal GDP, Value traded ratio, Market capitalization ratio, Discount rate and Openness ratio and have applied ARDL bound testing. Their study has found positive association between the two. Moreover, (Ujunwa & Salami, 2010) investigates Stock market enhancement and economic growth. They have taken different variables including GDP per capita, Total value of shares traded, Turnover ratio, Total market capitalization for Nigeria. They also used Inflation rate, Government consumption expenditure and Gross capital formation. They have applied Time-series Ordinary Least Squares techniques and have found Positive association in presence of the stock market size and turnover ratios proxies of stock market development. Bernard and Austin, 2011 have identified stock market development influence on economic growth in Nigeria. They have done analysis by using a time-series OLS approach for the study variables those are; Real GDP, Stock market capitalization, Value traded ratio and Turnover ratio. They state that the relationship is positive when the when stock market development is proxied by turnover ratio. Ujunwa and Salami, 2010 have used GDP per capita, Total market capitalization Total value, of shares traded, Turnover ratio, Inflation rate, Gross capital formation Government consumption expenditure variables for analyzing the stock market development role in economic growth for Nigeria. They have applied ordinary least square method and have found negative relationship when stock market development is proxied by total value of shares traded. Bernard and Austin (2011) have found positive association between market-based financial development and economic growth. The literature is rich of evidences which show the positive association of market-based finance and economic growth. There's ongoing debate about financial system in which the dilemma shows that bank-based financial structure is better than market-based financial structure in explaining growth rate. Specifically, it is believed that the banking sector contributes more to economic growth because its induce long-term investment in the real sector. On the other hand, there maybe sensitivity to stock market prices in the market-based system where involved the number of short-term investments (Hoshi *et al*., 1990). Furthermore, Morck and Nakamura's (1999) states that financial institutions of a country are debt providers are biased to farsightedness.

Levine (2004), identify those markets gives some better tools to manage the risk and these tools allow high customization of risk-ameliorating appliances (Levine, 2004). Furthermore (Greenwood and Smith, 1997) states that Stock market minimize saving mobilization costs which works to improve the investment. Diamond (1984) states that markets gives information about specialization and also acquisition which ease the level of further investments. The Endogenous growth literature supports the positive role of financial development in economic growth (Bencivenga & Smith, 1991).

Need and Objectives of the Study

The previous literature illustrates that financial development drives economic growth in developed and high-income economies of countries. This study is to examine whether it's also significant in the developing south Asian countries. This study employing panel data for the time period of 1980- 2017 to explore the role of stock market financial development indicators on economic growth. The previous studies have used single proxy, variables or mixed components for financial development but this study practice only stock market indicators to find its impact on economic growth.

Methodology of the study

Data

This study explores the effect of market based financial development on economic growth by employing panel data set for the time period of 1980 to 2017 of four south Asian countries namely Sri Lanka, Bangladesh, India and Pakistan. The selection of this sample is entirely based on data convenience for a adequately longer time period. Data for all variables on stock markets as well as the control variables all were downloaded from the (WDI) World Development Indicators, published by (WB) World Bank. Market based financial development variables used are; the total stocks traded value (TVTR), the turnover over ratio of stocks (TUOR) and stock market capitalization while economic growth is proxy by per capita. Other control variables were added, namely: inflation, real interest rate, saving and trade openness.

Estimation method and Model of the study

This study employs dynamic panel to study the role of market based financial development in economic growth in south Asian-4 countries. Following are the models illustrate the linkage of bank based and market based financial development with economic growth.

$$GDPPC_{it} = \alpha_0 + a_1 MFD_{it} + a_2 TO_{it} + a_3 INF_{it} + a_4 RIR_{itt} + + a_5 SAV_{it} + \delta i + \epsilon_{it}$$

Model 1 states to examine the impact of Market-Based financial development index on economic growth. Above equation illustrates the dependent, explanatory and control variables where, GDPPC is GDP per capita which denote economic growth, MFD is the index of market based financial development constructed of three stock market variables namely; turnover over ratio, market capitalization (CAP) and total value of stocks traded (TV) used as a proxy for market based financial development. Other control variables used are; trade openness (TO), Inflation (INF), real interest rate and saving (SV), δ is unobserved country specific effect, while εt is the error term. The dependent variable in the model is lagged GDPPC and there are time invariant country specific fixed effects. Country fixed effects emission in the panel data will lead to inconsistent estimators in levels and will be biased (Hsiao,1986). The explanatory variables here can be endogenous, thus it need to be controlled for endogeneity issue of the explanatory variables. (Chen, 2006) and (Levine & Zervos, 1998) used the initial values of the explanatory variables to avoid the simultaneity problem such result loss in information and potential consistency loss interpreting the estimation inefficient ((Beck & Levine, 2004). For efficient consistent model construction, the initial values be replaced with instruments. For the said purpose the developed model of Arellano and Bond (1991) first-difference GMM estimation method is used. Thus, following the methodology of (Arellano & Bond, 1991) the given model below has been specified for the current study. In equation (2), first-differencing eliminates the intercept as well as the country-specific effects.

$$Y_{it} = Y_{i,t-1} = \beta(Y_{it-1)} - Y_{i,t-2}) + \Upsilon(X_{i,t} - X_{i,t-1}) + (\epsilon_{it} - \epsilon_{i,t-1})$$

Analysis and findings

The effects of Market-Based financial development on economic growth

The results of the FE, difference GMM and system GMM dynamic panel estimations with regard of market-based financial development for in four South Asians countries (Pakistan, India, Bangladesh and Sri lanka) are given in Table 1.
The results of the FE, difference GMM and system GMM dynamic panel estimations for South Asians four countries (Pakistan, India, Bangladesh and Sri Lanka) are given in Table 1. GDPPC is the gross domestic per capita is the dependent variable along with a set of independent variables, including the composite index for market based financial development (FDM).

Table 1: The effects of Market-Based financial development on economic growth

Variables	(FE) Loggdppc	(DGMM) Loggdppc	(SGMM) Loggdppc
FDM	0.001***	0.001***	0.001*
	(0.001)	(0.001)	(0.001)
Trade Openness	-0.005***	-0.000***	0.0001
	(0.002)	(0.0002)	(0.000)
Inflation	0.002	-0.002***	-0.001**
	(0.008)	(0.0007)	(0.000)
Real Interest Rate	0.007	-0.003***	-0.002**
	(0.010)	(0.0009)	(0.000)
Saving	0.031***	0.000	0.001***
	(0.004)	(0.000)	(0.000)
		0.959***	1.003***
Loggdppc$_{it-1}$		(0.0125)	(0.003)
			-0.002
Constant	6.312***		(0.030)
	(0.212)		
Observations	62	57	62
R-squared	0.671		
Number of id	4	4	4
AR1		-0.60(0.550)	-0.50(0.531)
AR2		-1.24(0.213)	-1.23(0.212)
Sargan Test		111.63(0.060)	132.47(0.070)

Note: Standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

This study employs three proxies. Market-Based financial development is proxies by three indicators of stock market, namely stock traded value (VT), Market Capitalization (MKT) and stock turnover ratio (TR) for investigating the role of stock market development in economic growth.

The results indicate that the coefficient of the lagged dependent variable is positive and statistically significant. The findings of this study on the relation between stock market development and economic growth are positive and significant in all three models indicates that all three proxies collectively to stock market coefficient are positive and statistically significant Therefore after controlling for the potential endogeneity of the explanatory variables, it can be concluded that market based financial development index has a positive impact on economic growth in south Asian-4 countries. The finding of current study re-enforced by the studies of Carp 2012; Azam et al. 2016; Masoud 2013, (Enisan & Olufisayo, 2009). These findings indicates that the stock market development have an important role in financial development proxies by market based financial indicators with liquidity, capital adequacy and investments as well economic resources mobilization in an inefficient way. Furthermore, Beck and Levine (2004), Rousseau and Wachtel (2000) have also found that stock market development have positive impact on economic growth.

Furthermore, stock market development also assists in capital accumulation which can allow small investors which invest financial assets in the capital markets such as investment in bonds, stocks and debenture. According to the results of this study, a well preforming and development of stock market is a key indicator of macroeconomic development because it can motivate domestic and foreign investors for investment into the country which is an energizer for industrialization (Cos̜kun et al. 2017; 2016; Petros 2012); Pohoa̧tă et al. Cooray 2010).

According to the results, market based financial indicators positively affects economic development in Asians markets of four south Asian countries (Pakistan, India, Bangladesh and Sri Lanka). Further, this relationship is statistically significant at the 1, 5 and 10 percent level confirming that market based financial development stimulates economic growth of sampled south Asians countries. . In addition, per capita income is also a common factor in growth regressions and the current study observed a positive relationship between the GDP per capita income and market-based financial development which is consistent with the findings of Deyshappriya (2016), Banda (2005), Beck and Levine (2004), Levine (1993) and Osinubi (2002) and(Moyo, Khobai, Kolisi, & Mbeki, 2018). This is also consistent with the argument that well-developed domestic financial sectors in countries contribute significantly to economic growth. For example, a 1% increase in the ratio of credit to private sector implies

an increase in growth for 0.1% as predicted by FE, GMM and system GMM. The results are consistent with previous studies, which find a positive relationship between the measures of financial development and growth (Nyasha and 2015; (Odhiambo, 2011); Sahoo 2014; Adu *et al*. 2013; Hassan *et al*., 2011; Levine 2005; Levine and Zervos (1996)). A well financial system of countries of financial market development plays a crucial role to boost of economic growth resulting good living standard and prosperous countries. Apart from that GDP per capita and saving are positively affected economic growth and are highly statistically significant in FE and system GMM, while the results of trade openness is statistically significant in FE and difference GMM, and the relationship is negative which reveal the trade openness of trade among four countries are not very well, due to many political reasons and international relationship. Infect the trade is of the most important drivers of economic growth but there is almost very less trade occur among those four countries due to some big reasons such as political reasons and weak governance. In additions, Openness of the economy has also been considered a source of growth by many scholars such as Banda (2005), Levine and Zervos (1998) and Beck and Levine (2004). They have verified that there is a positive relationship between economic openness and economic growth in both developed and developing countries. According to Banda (2005) free trade and economic liberalization stimulate the allocation efficiency of an economy which, in turn, stimulates higher economic growth. In addition, Krueger (1997), Helpman and Krugman (1969) highlighted the inefficiencies of import-substitution policies, and mentioned that free trade shifts resources from inefficient import-substitution activities to efficient comparative advantage ones.

Likewise, the estimated coefficient of inflations and real interest rate are statistically significant and the relationship is negative which implies that 1% increase in the real exchange rate cause to decrease economic growth in south Asians four countries (Pakistan, India, Bangladesh and Sri Lanka). Indeed, the ups and downs of real interest rate in four countries decrease the economic growth due to political instability and weak governance resulting increase in inflation which effects economic growth of the four sampled countries of the current study. Conversely, inflation has become an insignificant factor in explaining economic growth. Ireland (1994) and (Deyshappriya, 2016) also obtained the insignificant results, and stressed that the impact of inflation on economic growth is considerably low, and may die out entirely in the long run. In the context of model specification, the null hypothesis of the Sargan test suggests that over-identifying restrictions are valid. According to the p-value of the Sargan test, the null hypothesis cannot be rejected at 1 and 5 level; therefore, the included instruments in the model are valid. Similarly, the null hypothesis of the serial correlation test of difference and system GMM indicates that the error terms are not serially correlated. Further, the AR2 insignificant p-value (0.213) and (0.212) of the serial correlation test confirms that the error terms are not serially correlated. Therefore, the estimated GMM dynamic panel data model aligns with the econometric theory.

Conclusion

The current study investigates the impact of both Bank based financial development and stocks market development on economic growth in south Asian-4 countries (India, Pakistan, Sari Lanka and Bangladesh) for the time period of 1980-2017. Utilizing four alternative panel models (fixed effect, Difference GMM and System GMM). The null hypothesis of the study is abnegated. Controlling for endogeneity issue and specific country's effects, the data are reliable with theories that accentuate a consequential positive role in the process of economic growth for stock market financial development and banks based financial development jointly. The paper assessed both index of financial development and finds its effect on economic growth individually. We have applied different estimation techniques and procedure along with different control variables which gives the positive significant impact of both banks and stock markets development on economic growth. For instance, the two-step estimator of system GMM results prove that the bank based financial development index constructed of three variables are significant and positive mostly in all models, which betokens that bank based financial development play consequential role in boosting economic growth in samples countries of South Asia. Similarly, for markets based financial development such as market capitalization, stock turnover ratio and stock value traded, we find that market-based individual's financial development increases economic growth in four sample countries of South Asia.

The results of this paper have paramount policy implicative insinuation that a well performed financial system and policy is paramount for enhancing the development of financial market including that both bank and stock market improvement are paramount for growth rate in developing countries concretely the sampled south Asian-4 countries of this study. The study suggest the policymakers of sampled countries to further improve both market based and bank based financial system in terms of regulation and supervision which may further upsurge the vigorous link of financial development on economic growth in the sample countries of this study.

Conflict of Interests

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RESEARCH ARTICLE

Forensic accounting in predicting the financial performance growth of MTN mobile communication in Nigeria

Onah Vitalis Chukwuma[1*], Ugwu James Ike[2], Dada Stephen Babalola[3]

[1]Department of Forensic Accounting and Audit, Charisma university British west Indies United Kingdom
[2]Department of Accounting, Prince Abubakar Audu University (KSU) Anyigba, Kogi state, Nigeria
[3]Finance and accounting Department, Nigeria Airspace Management Agency, Calabar Airport

Corresponding Author: Onah Vitalis Chukwuma, Oshimiripalace@gmail.com

Abstract

To emphasize the importance of fraud reporting, fraud prevention, and litigation as forensic accounting instruments, it is necessary to address the issue of financial performance growth in every consistent manner for any company in Nigeria to avoid a collapse in financial performance. The purpose of this paper is to demonstrate how forensic accounting may be used to predict the financial performance and growth of MTN mobile communication in Nigeria in the future.

Methods: The data used for this study was collected from world bank publication, Nigeria stock exchange factbook and National bureau of statistics (NBS) record from a period of 1990 to 2021. The method of data analysis that will be adopted for this paper are ordinary least square (OLS) regression analysis, unit root test, and cointegration analysis. The ordinary least square (OLS) regression model was used in this paper, and the results show that the model is statistically significant, indicating that there is a significant relationship between forensic accounting instruments and growth in financial performance. According to the coefficient of determination (R-squared), forensic accounting indicators can explain approximately 73 per cent of the variation in financial performance growth. This indicates that the fitted model is adequate for predicting the growth of financial performance in the future. A long-term relationship exists between forensic accounting and the financial performance growth of MTN mobile communication in Nigeria, according to the results of the Johansen cointegration test, which was conducted recently. The regression analysis conducted for this paper reveals that the number of fraud cases reported and the rate of fraud prevention, both of which are forensic accounting indicators, are statistically significant and have a positive significant impact on financial performance growth. Furthermore, if fraud is not controlled, it has the potential to devastate the financial performance of telecommunication companies. Therefore, MTN and other telecommunication companies must put in place a policy within their respective organizations that will continuously fund the cost of forensic accounting so that they can maintain a sustainable level of financial performance growth.

Keywords: Financial performance growth; forensic accounting; OLS regression model; R-squared; Johansen cointegration

Introduction

As a result of the increasing prevalence of fraudulent practices in modern organizations, traditional auditing and investigation methods have become inefficient and ineffective in the detection and prevention of the various types of fraud that confront businesses around the world, particularly in Nigeria. Oyejide (2008) said that fraud is a topic that has gotten a great deal of attention both internationally and in Nigeria, and that this is true. This heightened awareness has been fueled by several high-profile incidents involving a variety of organizations. In the academic literature, issues linked to fraud have also been the subject of careful theoretical and empirical investigation (Appah &Appiah, 2010). The increasing prevalence of fraud, according to Karwai (2002), is causing significant disruption in the Nigerian telecommunications business. There are billions of dollars in losses as a result of telecommunication fraud. Respondents to a recent Communications Fraud Control Association (CFCA) fraud study reported a total of $2 billion (USD) in proven fraud losses at their respective companies, according to the results of the poll (Communications Fraud Control Association, 2011). The most common types of fraud losses recorded by operators are compromised voicemail systems, subscription theft,

and by-pass fraud, among others. The reason for this is that fraud has permeated every element of Nigerian culture to the point that many businesses have lost the trust of their customers as a result of the fraud epidemic. According to Adesola (2008), the threat of fraud to the global economy is better illustrated by statistics released by Criminologists at a consulting firm, which revealed that over two hundred thousand cases of online fraud were committed in the United Kingdom in 2006, more than doubling the number of real-world robberies committed in the same period. According to the findings of the study, online fraud accounted for 75% of all card not present fraud in 2006. Fraud in both high and low locations is a source of concern for the global market. Enron, WorldCom, and other similar companies are well-known to us. In addition, we are seeing an increase in the number of scams committed in society. Following a string of corporate failures, Okunbor and Obaretin (2010) reported that accountants now have greater responsibility and function to equip themselves with highly sophisticated skills to identify and act upon indicators of poor corporate governance, mismanagement, and fraud and other malpractices. It has now become mandatory for accountants at all levels to possess the necessary skills and expertise for identifying, uncovering, and preserving evidence of all types of irregularities and fraud, regardless of their degree of experience. As a result, fraud requires a more complex strategy for its management, ranging from prevention to detection and investigation. When it comes to fraud management, including prevention, detection, and comprehensive control, one of the more contemporary techniques that can be used is the forensic accounting service. This is one of the more modern approaches that can be used. In the opinion of Hansen (2009), computer forensics is the most appropriate and, in many cases, the greatest instrument for investigators to utilize in the detection and implementation of white-collar crime investigations. forensic accounting, according to Degboro and Olofinsola (2007), is defined as the application of criminalistic methods, as well as the integration of accounting investigative operations and legal procedures, to detect and investigate financial crimes and related accounting misbehaviors. The persistent string of embarrassing audit failures that have occurred over the previous 52 years has triggered a paradigm shift in the accounting profession (Eliezer & Emmanuel, 2015). According to popular belief, forensic accounting developed in response to several newly discovered fraud-related incidents. While the Enron and WorldCom cases are well-known, recent scandals that have rocked the business world, such as the well-publicized Enron and WorldCom cases, have also brought the field of forensic accounting to the forefront. When it comes to identifying

financial wrongdoing, forensic accounting is considered a synthesis of all other investigation-related fields. Because financial fraud is becoming increasingly sophisticated, forensic accounting must be added to the arsenal of techniques available to investigators and prosecutors to ensure that those involved in criminal activities are successfully investigated and prosecuted (Moduga & Anyaduba, 2013). Generally speaking, forensic accounting is expected to provide some relief from the perceived vulnerability of standard accounting and auditing systems to financial fraud. The use of forensic accounting services in fraud management in the Nigerian telecommunications industry is projected to be a topic of great importance in the sector shortly. Unfortunately, the application of forensic accounting skills in the management of financial fraud in telecommunication businesses in Nigeria has not piqued the interest of policymakers in the industry and regulators of Nigeria's telecommunications sector. There has been a great deal of scholarly attention paid to forensic accounting and fraud control, detection, and prevention by scholars, writers, and academics in the field of accounting and other allied areas, but none of this literature has addressed forensic accounting and fraud management issues in the Nigerian telecommunications industry. Referencing the thread of studies by Akindele (2011), Chi-Chi & Ebimobowei (2012), Famous and Okoeguale (2012), Odi (2013), and others as cited in Eliezer and Emmanuel (2015), which have focused on the impact of fraud on commercial banks' performance, while another thread of studies by Idowu (2009), Nwaze (2006), Ogunleye (2010) have focused on the factors that influence the Other studies on forensic accounting, fraud detection, and prevention include those by Eliezer and Emmanuel (2015), Temitope (2014), Dada, Ajao, and Okwu (2013), Modugu & Anyaduba (2013), Okoye & Gbegi (2013), Augustine & Uagbale-Ekatah (2013), and Modugu & Anyaduba (2012). Litigation, fraud detection, fraud cases reported, and fraud prevention rate are some of the forensic accounting indicators that will be used in predicting MTN's financial performance. The major purpose of this study is to apply forensic accounting indicators to predict the financial performance growth of MTN mobile communication in Nigeria. Additionally, this research will look into the impact of forensic accounting on the financial performance growth of MTN mobile communication in Nigeria, as well as the relationship between forensic accounting and financial performance growth at MTN mobile communication in Nigeria.

Literature review

When forensic accounting was first introduced in the 1980s, it was considered a novel career, with the breadth of this new profession encompassing management accounting, auditing, and investigative abilities (Muslimat & Hammid, 2012). Individuals who served as the pharaoh's eyes and ears over his grain, gold, and other assets, according to Singleton and Singleton (2010), can trace the history of forensic accounting back to the reign of the Pharaoh in Egypt, where they worked as his eyes and ears. Forensic accounting is an indispensable tool for greater accountability, fraud detection, fraud reporting and fraud prevention that could jeopardize the performance growth of any company (Chariri.A, 2019). In addition to fraud investigation, fraud prevention, and the inspection of anti-fraud systems, they define forensic accounting as the collection of both financial and non-financial information, which includes both financial and non-financial information (Brown, Aiken, and Visser, 2020). Forensic accounting, on the other hand, is characterized by Crumbley (2016) as a subfield of forensic science that can be defined as the application of natural law to human laws, as opposed to criminal law. A forensic scientist who also provides an expert opinion regarding their findings in a court of law is regarded as an examiner and interpreter of evidence and facts in legal proceedings, according to the professor. Because it is an accounting science, it is expected that the examination and interpretation would be undertaken to obtain economic data. Based on financial data analysis, forensic accountants can compute values, draw inferences, and identify unusual patterns or questionable transactions. A forensic accountant's responsibilities include, among other things, identifying fraud offenders and tracing money laundering and theft operations, which may involve tax evasion and tax avoidance. Fraud, according to Modugu and Anyaduba (2013), is classified as a property crime. They define it as the illegal conversion of another's property into one's possession through the use of one's techniques. Williams (2005) delves more into the topic of financial crimes, which include fraud and corruption. According to Williams's (2005) description of the phenomenon, bribes and cronyism are among the methods of corruption used. Other methods of corruption include political donations, kickbacks, voicemail systems, telecommunication fraud, most notably MTN mobile communication (subscription/identity theft, international revenue share fraud, credit card fraudulent transactions, and bypass fraudulent transactions), artificial pricing, and other types of fraud. To cover all of the aspects of financial crime, several of which have already been discussed, it is impossible to list them all. The Economic and Financial Crimes Commission Act 2004, which is cited in Modugu and Anyaduba (2013), tries to capture economic and financial crimes that are committed within or outside the organization's borders. By the Economic and Financial Crimes Commission (EFCC) Act (2004), violent, criminal, and illicit actions are defined as those performed to illegally accumulate riches in a manner that violates existing regulations. In addition to child labor, illegal oil bunkering and illegal mining, tax evasion, and foreign exchange malpractice, such as the counted currency mafia, these activities include all forms of fraud, narcotics drug trafficking, money laundering, embezzlement, bribery, and looting. Among the financial crimes committed by corporate entities, as well as those described by the provision's authors, are those involving money laundering (William, 2005; Khan, 2005). According to historical evidence, financial crimes have been linked to the demise of numerous corporate entities in the past. According to Cotton (2003), corporate-wide fraud was to blame for the failure of Enron, WorldCom, Tyco, and Adelphia, among other companies. The fraudulent scheme is estimated to have cost 460 billion (USD). It has been determined that Cacao Nigeria Plc's financial records were fraudulently altered by the company's management, resulting in an N15 billion loss in the Nigerian market. Various financial malpractices are believed to have resulted in the loss of approximately one trillion nairas in Nigeria's nine collapsed commercial banks. According to the EFCC Act (2004), the EFCC is still investigating this situation. According to operators in the telecommunications industry, the following are the top five (5) categories of fraud losses: Fraud losses totalled 4.96 billion (USD), with 4.32 billion (USD) attributed to compromised PBX/Voicemail systems, 3.84 billion (USD) attributed to international revenue share fraud, 2.88 billion (USD) attributed to by-pass fraud, and 2.40 billion (USD) attributed to credit card fraud in 2013. It is possible to commit financial fraud in a variety of ways, and it is usually done by both individuals and organizations. The nature, character, and mode of operation of financial fraud in businesses vary significantly depending on the industry (Ajie&Ezi, 2000; Karwai, 2002). A fraudster who is distinct from another fraudster and a fraudster who conducts fraud using different methods are two types of fraudulent activity that can be distinguished in general. Internal fraud, external fraud, and mixed fraud are all types of fraud that can be classified according to the characteristics of the perpetrators. Internal fraud is committed by members of the organization's staff and directors, whereas external fraud is committed by individuals who are not affiliated with the organization, and mixed fraud is committed by outsiders who work in conjunction with the organization's staff and directors to perpetuate the fraud. According to Karwai (2002), pinpointing the root causes of fraud can be a difficult undertaking. Moreover, as he pointed out, modern-day

corporations generally perpetrate frauds through a sophisticated web of conspiracy and deception, which serves to conceal the true nature of the fraudulent activity. In a study conducted by the researchers Ajie and Ezi (2000), it was discovered that on average, out of every ten employees, eight would look for opportunities to steal if given the opportunity, and only four would be honest in their daily work. In addition to that, forensic accounting is available. Forensic accounting, according to Joshi (2003), is defined as the application of specialized knowledge and specific talents to unearth evidence of economic abnormalities. Howard and Sheetz (2006) define forensic accounting as the process of evaluating, summarizing, and presenting complicated financial issues in a timely and factual manner, most often as a witness in a legal proceeding. Particularly relevant is the application of accounting discipline to the resolution of factual disputes in commercial litigation, which is the subject of this paper (Okunbor & Obaretin, 2010). Forensic investigation, according to Degboro and Olofinsola (2007), is defined as the discovery and establishment of facts to support a legal claim or action. Therefore, forensic accounting techniques can be applied to the detection and analysis of crimes, allowing investigators to uncover all of the underlying characteristics and identify the perpetrators. As Gray (2008) argues, forensic accountants are the best-prepared professionals to conduct forensic investigations because they combine the skills of an auditor with the skills of a private investigator. Law enforcement agents require a wide range of skills including investigative abilities, research skills, legal knowledge, mathematical methods, financial knowledge, auditing and accounting knowledge, as well as the ability to think critically. The primary responsibility of a forensic accountant is to examine complex financial and business-related issues, interpret and synthesize them, and present them in a way that the general public can understand and appreciate. Internal control systems have been referred to as the most important tool for preventing and detecting fraud in a variety of settings, including financial institutions (Wells, 2004). Forensic accounting, as defined by Dhar and Sarkar (2010), is the application of accounting concepts and procedures to the resolution of legal disputes. When fraud is discovered, it must be reported as soon as possible, and the report is admissible as evidence in a court of law or an administrative hearing procedure. A forensic accountant's skills are applied in potential, real civil or criminal disputes, such as determining losses or profits, incomes and damages, internal control estimations and frauds, and other situations involving the incorporation of accounting knowledge into the legal system. According to the Association of Certified Fraud Examiners (ACFE), forensic accounting is defined as the application of skills in potential, real civil or criminal disputes.

Review of Financial performance growth of MTN Nigeria Communication PLC

The Nigerian telecommunications industry has grown exponentially in the last two decades as a result of deregulation and liberalization (NCC, 2020). While the sector contributed only 0.1% of Gross Domestic Product (GDP) in 1999, it will generate 2.3 trillion in revenue in quarter 2, 2020, accounting for 14.30% of total GDP (NBS, 2020). The sector has established itself as one of the most resilient in Nigeria, contributing to the country's positive growth in the gross domestic product by capitalizing on the country's rapidly growing population. The Coronavirus pandemic has wreaked havoc on economies worldwide, including those in Nigeria. On the other hand, the telecommunications industry has benefited enormously from the pandemic (NCDC, 2021). The current popularity of lockdown directives and work-from-home policies has boosted the demand for virtual communications, internet access, and teleconferencing services (NCDC, 2021).

Nigeria's telecommunications industry also benefited from the pandemic printing, posting an 18.10% real growth in quarter 2, 2020, despite the economy contracting by 6.10% in quarter 2, 2020, putting the country on track to enter its second recession in less than five years (WHO, 2020).

As of July 2020, the data indicated that Nigeria had 198.9 million GSM mobile subscribers. MTN Nigeria led the market in Nigeria with a 40.39 per cent lion's share, followed by its fiercest competitors Airtel (26.99%) and Glo (26.99%). (26.51 per cent). With 12,163,330 GSM subscribers, 9mobile (formerly Etisalat) has the smallest market share at 6.11 per cent (NSE, 2020). An examination of the nitty-gritty of Nigeria's leading telecom's performance (MTN Nigeria) should shed light on how Telecoms fared both during and after the lockdown. MTN Nigeria is well on its way to achieving its lofty annual revenue target of $1 trillion.

MTN Nigeria added 6.8 million subscribers, bringing the total number of mobile subscribers on the network to 71.1 million by June 2020. Revenues generated in the first half of the year increased by 12.5% to 638.08 billion, up from 566.95 billion in the same period last year. Revenue growth was primarily driven by a 12.6% increase in revenue from services provided, which accounted for 99.8% of total revenue during the quarter (NCC, 2021).

Research methodology

This study adopted a secondary quantitative research design which involves the collection of quantitative data from already existing reliable sources such as where the data used for this work is collected. The quantitative data used for this work is also called secondary data and was collected from a world bank publication, the Nigeria stock exchange factbook and the National Bureau of Statistics (NBS) record from a period of 1990 to 2021. The secondary quantitative research was used to analyze the relationship between two variables of interest in this study and also to make useful future predictions. The method of data analysis that will be adopted for this paper is descriptive statistics (using mean and standard deviation for the data summary), ordinary least square (OLS) regression analysis, unit root test, and cointegration analysis. The variables of interest in this study are forensic accounting and the financial performance growth of MTN mobile communication.

Forensic accounting indicators are Litigation, Fraud detection, Fraud cases reported, and Fraud prevention rate, which are the independent variables while the dependent variable is the financial performance growth of MTN mobile communication. The computer software for the analysis of this work is EViews version 11.0.

Results and discussion

Table 1. Variable measurements

Variables	Measurements (unit)
Financial performance growth	Percentage (%)
Litigation	Percentage (%)
Fraud detection	Percentage (%)
Fraud cases reported	Percentage (%)
Fraud prevention	Percentage (%)

Source: Author

OLS regression analysis

Regression analysis is an analytic technique that is very appropriate for predicting a dependent variable with one or more independent variables. It also establishes relationship between the variables as well as the impact of independent variables on the dependent variable. The regression model adopted for this paper can be expressed as follow;

$Y = \beta_o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$

where

Y = Financial performance growth of MTN mobile communication

X_1 = Litigation

X_2 = Fraud detection

X_3 = Fraud cases reported

X_4 = Fraud prevention rate

β_o is the constant term or the intercept while β_1 to β_4 are the coefficient estimate of the independent variables while ε is the random error term.

The constructed model for this research is regression model and it is a parametric test predicting the financial performance growth of MTN mobile communication. Dependent variable is financial performance growth of MTN mobile communication, while the independent variables are forensic accounting indicators are Litigation, Fraud detection, Fraud cases reported, and Fraud prevention rate.

The normality and multicollinearity check are necessary to ensure the model is reliable and robust. Multicollinearity usually caused a misleading R-squared and P-values (that is, misleading results) if present. The Shapiro-Wilk test (Razali, Norna diah; Wah, Yap Bee, 2011) was performed to test for normality of the data set and variance inflation factor (VIF) is the indicator for the checks of multicollinearity (O'Brien, R. M, 2007). If VIF is less than 5 (VIF<5), it means the model does not suffer from the problem of Multicollinearity. However, for normality, the null hypothesis strictly state that the data is normally distributed when it is accepted (that is, P>0.05) and not normally distributed if rejected. EViews version 11.0 is the computer software that will be used for this research paper.

Unit root test

When a series lacks stationarity, the unit root test, also known as the stationarity test, detects the presence of a unit root, which may yield erroneous findings if not eliminated. Unit root testing is performed using the augmented dickey-fuller (ADF) test to eliminate the possibility of erroneous results. The hypothesis to accomplish the unit root test is stated below as:

H_0: there is a presence of a unit root (series is not stationary) vs H_a: there is no unit root (the series is stationary). The ADF test can be presented mathematically as:

$$\Delta Y_t = \theta + \gamma Y_{t-1} + \sum_{i=1}^{p} \beta_i Y_{t-i} + \omega_t$$

Where, θ is a constant, γ is the coefficient of process root, β_i coefficient in time tendency, p is the lag order and ω_t is the disturbance (error) term.

3.4 Cointegration analysis

Johansen cointegration test is an approach for testing cointegration of integrated series with zero level I (0), order 1, I (1)- after first difference or of order 2, I (2)- after second difference (Johansen, 2001). This test permit

more than one cointegrating relationship. So, it is more generally applicable than Engle-Granger test which is based on the Dickey-fuller (or augmented) test for unit root. There are two types of Johansen test which are the trace and max eigen value, and they form the basis of the inference or decision and their result might be little different from other.

The Var model indicated by Var(p) is mathematically defined in a general term below as:

$y_t = a + \beta_1 y_{t-1} + \beta_2 y_{t-2} + \ldots + \beta_p y_{t-p} + e_t$

It is important to note that the variables should be stationary before proceeding to Johansen Cointegration test.

Table 2. Descriptive statistics

Variables	Observations	Mean	Standard deviation
Financial performance growth	32	85.84	10.74
Litigation	32	70.72	8.52
Fraud detection	32	52.56	7.75
Fraud cases reported	32	63.53	8.83
Fraud prevention	32	12.19	2.33

Source: Author's computation using EViews software

The fraud detection (M = 52.56, SD = 7.75) means that the average fraud detection is about 53% with variability of about 8%. Fraud cases reported (M = 63.53, SD = 8.83) indicate that the average of reported cases of fraud

Result and Interpretation

Table 2 show that financial performance growth (M = 85.84, SD = 10.74) indicate that average financial performance of MTN mobile communication grow by about 86% with variability of about 11% which agree with the situation on ground as MTN Nigeria benefited greatly from the pandemic situation with an usual increase in subscribers making MTN the lead in telecommunication. Litigation (M = 70.72, SD = 8.52) implies that the average litigation cases is about 71% with variability of about 9%.

is about 64% with variability of about 9%. In the same vein, fraud prevention (M = 12.19, SD = 2.33) implies that the average of fraud prevention within the period under review is about 12% with the variability of about 2%.

Table 3. Ordinary least square (OLS) Regression analysis

Variables	Coefficient estimate	STD error	Test statistic	P-value
Financial performance growth				
Litigation	0.1926	0.234	0.82	0.417
Fraud detection	0.0999	0.175	0.57	0.574
Fraud cases reported	0.6199	0.221	2.81	0.009*
Fraud prevention	1.4533	0.496	2.93	0.007*
Constant	9.8805	9.720	1.02	0.318
Model P-value	0.0000			
R-squared	0.7319			

Where asterisk * represent 1% significant level
Source: Author's computation using EViews software

Table 3 shows that the overall model (P<0.01) indicate that the OLS regression model is statistically significant and this indicate that there is a significant relationship between Financial performance growth and forensic accounting instruments such as litigation, fraud detection, fraud cases reported, and fraud prevention. R-squared = 0.7319 indicate that about 73% variation in financial performance growth can be explained litigation, fraud

detection, fraud cases reported, and fraud prevention. The regression model is significant and R-squared is relatively large which implies that the regression model is an adequate fit for the data and it is very appropriate for future prediction of MTN financial performance growth. Besides, fraud cases reported (β = 0.6199, P<0.01) and fraud prevention (β = 1.4533, P<0.01) indicate that fraud cases reported and fraud prevention are statistically significant and therefore have significant impact on financial performance growth.

Table 4. Unit root test (Augmented Dickey fuller)

Differenced Variables	Test statistic	P-value	Order
Financial performance growt	-7.32	0.0000*	I (1)
Litigation	-7.60	0.0000*	I (1)
Fraud detection	-8.57	0.0000*	I (1)
Fraud cases reported	-4.94	0.0005*	I (1)
Fraud prevention	-4.88	0.0006*	I (1)

Asterisk * represent 1% level of significance
Source: Authors computation using E-views

Table 4 shows the unit root test result using augmented dickey fuller approach and we can see that all the series (financial performance growth and forensic accounting indicators) are statistically significant which implies that they are stationary after the first difference. It also suggested that all the series are integrated of order 1. Since the series are stationary, hence, further time series analysis like cointegration test can be conducted.

Table 5. Johansen cointegration test

Lags interval (in first differences): 1 to 2

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.698189	92.03700	69.81889	0.0003
At most 1 *	0.611923	57.29633	47.85613	0.0051
At most 2 *	0.417355	29.84634	29.79707	0.0493
At most 3	0.320944	14.18120	15.49471	0.0781
At most 4	0.096930	2.956697	3.841466	0.0855

The table 5 indicates three cointegrating equations are significant at 5% level and their trace statistic values are greater than their corresponding critical values which means that there is existence of cointegration among the series and this suggest a long run relationship between forensic accounting and financial performance growth of MTN in Nigeria.

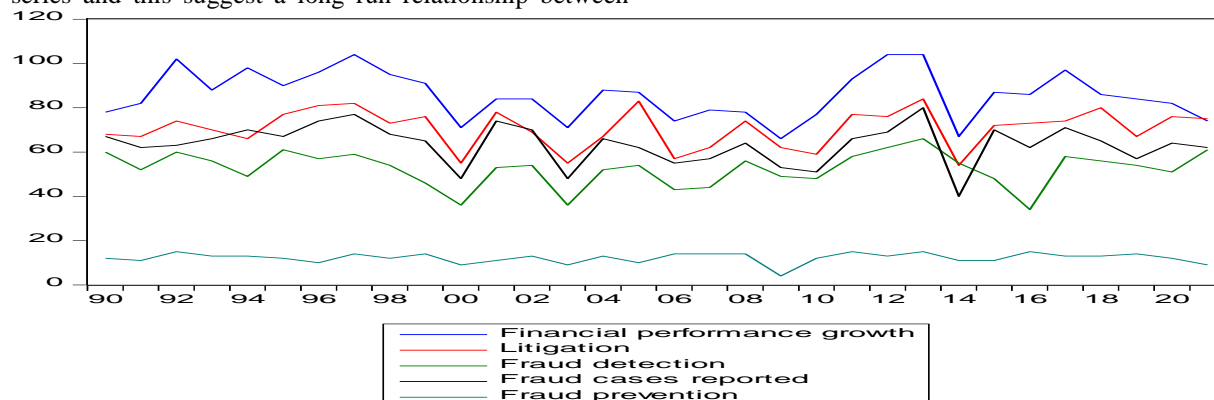**Figure 1:** Graph of MTN financial performance and forensic accounting indicators

Figure 1 shows the graph of MTN financial performance and forensic accounting indicators (litigation, fraud detection, fraud cases reported and fraud prevention). The financial performance growth is seen to have the highest but fluctuating growth pattern from 1990 to 2021 being the period under review with fraud prevention having the lowest fluctuating growth pattern.
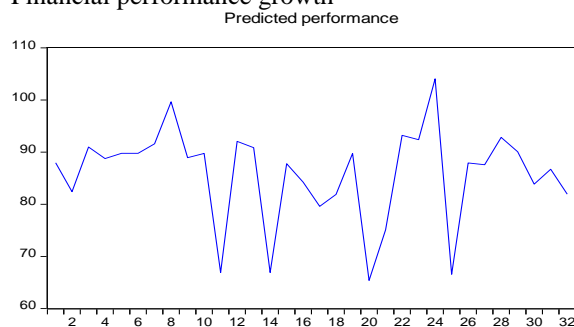
Figure 2: Graph showing the future prediction of Financial performance growth

Predicted performance

Figure 2 reveals the graph showing the future prediction of Financial performance growth of MTN mobile communication and we can see that the prediction is very close to the actual value with no volatility clustering and this implies that the future financial performance growth of MTN Nigeria is constant with no fear of future collapse in their financial performance growth.

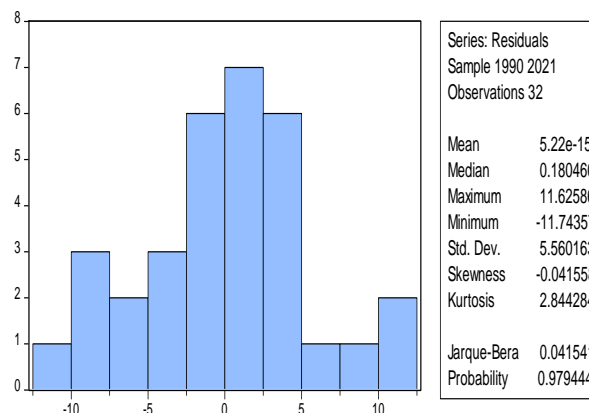| Series: Residuals	
Sample 1990 2021	
Observations 32	
Mean	5.22e-15
Median	0.180460
Maximum	11.62586
Minimum	-11.74357
Std. Dev.	5.560163
Skewness	-0.041558
Kurtosis	2.844284
Jarque-Bera	0.041541
Probability	0.979444

Figure 3 shows the normality test ($P>0.01$) using Jarque-Bera and we can see that the residual error is approximately normally distributed at 1% level of significant. We can also see that from the statistics that skewness approaches zero while kurtosis is approximately 3 which also indicate that assumption of normality is satisfied.

Diagnostic test

Figure 3: Normality test

Table 6. Multicollinearity

Predictor variables	VIF
Litigation	3.46
Fraud detection	1.61
Fraud cases reported	3.33
Fraud prevention	1.17
Mean VIF	2.39

Source: Author's computation using EViews software

Table 6 shows that the variance inflation factor (VIF) of all the predictor variables are less than 5 (VIF<5) which indicate that the regression model does not suffer from the problem of multicollinearity.

Table 7. Heteroscedasticity and Autocorrelation

Test	Obs'R-squared	P-value
Heteroscedasticity	4.1489	0.3862
Autocorrelation	0.6495	0.7227

Source: Author's computation using EViews software

Table 7 shows that $P>0.05$ for both the heteroscedasticity and autocorrelation test which means that the regression model does not occur the problem of heteroscedasticity and autocorrelation. This also satisfy the ordinary least square assumption for the regression model. This make the model robust and very reliable.

Conclusion and recommendation

Specifically, the primary goal of this research paper is to use forensic accounting instruments to predict the financial performance of MTN mobile communication in Nigeria and the growth of its financial performance. The descriptive statistics reveal that MTN's financial performance increased by approximately 86 per cent, which is consistent with the reality because MTN Nigeria benefited greatly from the covid-19 pandemic situation and has experienced an unusual increase in subscribers, propelling them to the top of the telecommunication market leaderboard which is very consistent with NCC (2021) report. The regression model demonstrates that forensic accounting indicators such as the number of reported fraud cases and the level of fraud prevention have a positive and statistically significant impact on the financial growth of MTN. The implication of this is that timely reporting of fraud cases to a regulatory body such as the EFCC, followed by prompt action to prevent fraud will ensure that MTN continues to achieve consistent financial performance growth which support the works of Chariri (2019) and Brown, Aiken, and Visser (2020). While this is happening, the regression model is significant, indicating that there is a statistically significant relationship between forensic accounting and the financial performance growth of MTN mobile

communication. It is because all of the model assumptions were met that the coefficient of determination (R-squared) is relatively large, making the model very robust and suitable for predicting the financial and economic growth of MTN Nigeria.

However, the Johansen cointegration test was used to conduct the cointegration test, and the results indicate that there is a long-term relationship between forensic accounting and financial-economic growth. The forecasting of future values of financial performance

growth reveals that the financial performance growth of MTN will continue to grow at a constant and positive rate in the future, with no danger of a future performance collapse. For this reason, to maintain a consistent financial growth performance, MTN management should establish a policy that will implement proper forensic accounting procedures in order to mitigate fraud that could affect their financial performance growth.

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